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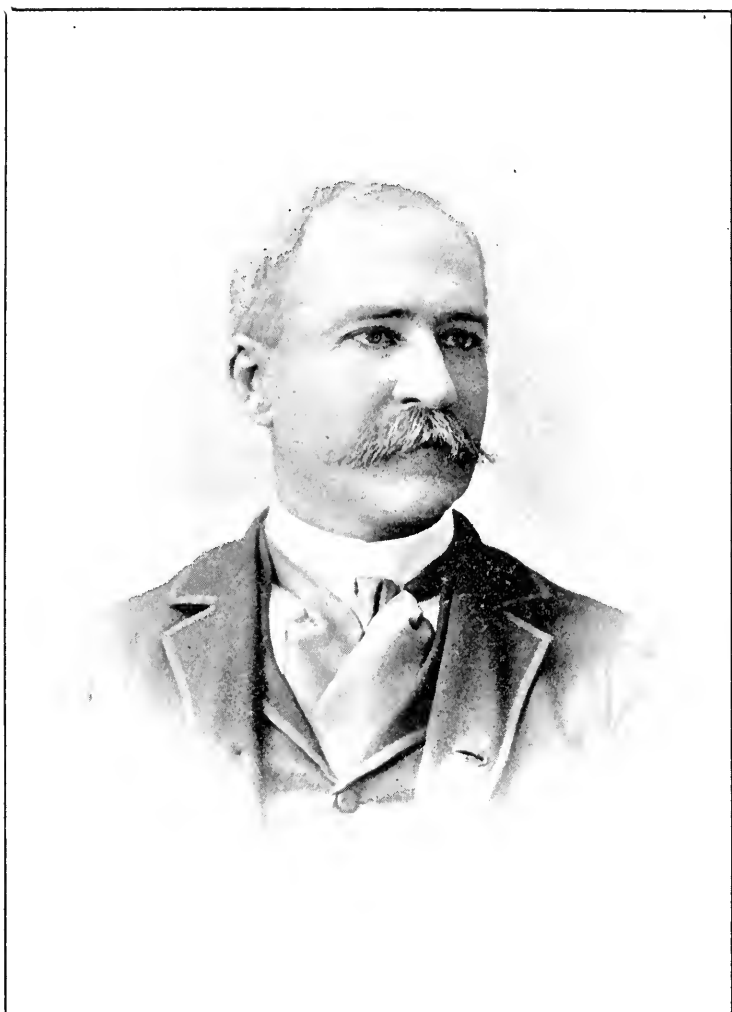
1890

HERBARIUM

THE NEW YORK BOTANICAL GARDEN

ARON, NEW YORK 10458





HON. JOHN M. SAMUELS.

TWENTIETH ANNUAL REPORT

OF THE

SECRETARY

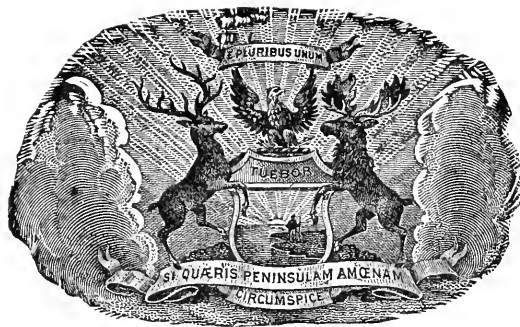
OF THE

STATE HORTICULTURAL SOCIETY

OF

MICHIGAN

1890



BY AUTHORITY

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REPORT OF THE SECRETARY
OF THE
MICHIGAN STATE HORTICULTURAL SOCIETY.

ALLEGAN, MICHIGAN, }
December 31, 1890. }

TO HON. CYRUS G. LUCE, *Governor of the State of Michigan:*

I have the honor to submit herewith, in compliance with legal requirement, the accompanying report of 1890, with supplementary papers.

Respectfully yours,
EDWY C. REID,
Secretary of the Michigan State Horticultural Society.

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OFFICERS

OF THE

STATE HORTICULTURAL SOCIETY FOR 1891.

PRESIDENT—T. T. LYON, South Haven.
VICE-PRESIDENT—CHAS. W. GARFIELD, Grand Rapids.
SECRETARY—EDWY C. REID, Allegan.
TREASURER—S. M. PEARSALL, Grand Rapids.
LIBRARIAN—THOMAS H. FORSTER, Lansing.

EXECUTIVE BOARD.

CHAS. W. GARFIELD, Grand Rapids, 1 year.	L. R. TAFT, Agricultural College, 2 years.
CHAS. A. SESSIONS, Mears, 1 year.	L. W. WATKINS, Manchester, 2 years.
	R. MORRILL, Benton Harbor, 3 years.
	C. J. MONROE, South Haven, 3 years.

STANDING COMMITTEES.

ON FRUIT CATALOGUE—T. T. LYON, South Haven, Chairman; 1st district, L. B. RICE, Port Huron; 2d district, E. H. SCOTT, Ann Arbor; 3d district, D. G. EDMISTON, Adrian; 4th district, W. A. BROWN, Benton Harbor; 5th district, GEO. C. McCLATCHIE, Ludington.

ON NEW FRUITS—T. T. LYON, Chairman; C. A. SESSIONS, Mears; S. R. FULLER, Eaton Rapids; C. ENGEL, Paw Paw.

ON FINANCE—C. J. MONROE, R. MORRILL, C. W. GARFIELD.

ON ENTOMOLOGY—ALBERT J. COOK, Chairman.

ON VEGETABLE PHYSIOLOGY—L. R. TAFT, Chairman.

ON LANDSCAPE GARDENING—JAMES SATTERLEE, Chairman.

ON VEGETABLE GARDEN—W. W. TRACY, Chairman.

ON FORESTRY—C. W. GARFIELD, Chairman, Grand Rapids; L. R. TAFT, Agricultural College; C. A. SESSIONS, Mears.

THE NEW YELLOWS LAW.

AN ACT to Prevent the Spread of Yellows, a Contagious Disease among Peach, Almond, Apricot, and Nectarine Trees, and to Provide Measures for the Eradication of the same, and to Repeal Act Thirty-two of the Session Laws of Eighteen Hundred and Seventy-nine.

SECTION 1. *The People of the State of Michigan enact*, That it shall be unlawful for any person to keep any peach, almond, apricot, plum, prune, cherry, or nectarine tree, infected with the contagious diseases known as yellows or black-knot, or to offer for sale or shipment, or to sell or ship to others any of the fruit thereof; that both tree and fruit so infected shall be subject to destruction as a public nuisance as hereinafter provided, and no damage shall be awarded in any court in the state for entering upon premises and destroying such diseased trees or parts of trees and fruit if done in accordance with the provisions of this act; and it shall be the duty of every person, as soon as he becomes aware of the existence of such disease in any tree, parts of trees, or fruit owned by him, to forthwith destroy or cause said fruit or trees to be destroyed.

SEC. 2. In any township in this state in which such contagious disease exists, or in which there is good reason to think it exists, or danger may be justly apprehended of its introduction, as such information becomes known to the township board or any member thereof, it shall [be] by the duty of said board to appoint forthwith three competent freeholders of said township as commissioners, who shall hold office during the pleasure of said board, and such order of appointment and of revocation shall be entered at large upon the township records.

SEC. 3. It shall be the duty of said commissioners, within ten days after appointment as aforesaid, to file their acceptance of the same with the clerk of said township, and said clerk shall be ex officio clerk of said board of commissioners, and he shall keep a correct record of the proceedings of said board in a book to be provided for the purpose, and shall file and preserve all papers pertaining to the duties and actions of said commissioners, or either of them, which shall be a part of the records of said township.

SEC. 4. It shall be the duty of the commissioners, or any one of them, upon or without complaint, whenever it comes to their notice that either of the diseases known as yellows or black-knot exists, or is supposed to exist, within the limits of their townships, to proceed without delay to examine the tree or fruit supposed to be infected, and if the disease is found to exist, a distinguishing mark should be placed upon the trees and the owner notified personally, or by a written notice left at his usual place of residence, or if the owner be a non-resident, by leaving the notice with the person in charge of the trees or fruit, or the person in whose possession said trees or fruit may be. The notice shall contain a simple statement of the facts as found to exist, with an order to effectually uproot and destroy by fire, or as the commissioner shall order, the trees so marked and designated, or such parts thereof within ten days, Sunday excepted, from the date of the service of the notice; and in case of trees known as nursery stock, or fruit so infected, such notice shall require the person in whose possession or control it is found, to immediately destroy the same, or cause it to be done, said notice and order to be signed by the full board of commissioners.

SEC. 5. Whenever any person shall refuse or neglect to comply with the order to remove and destroy the tree, or parts of trees so designated and marked by the commissioners as aforesaid, it shall become the duty of the commissioners to cause said tree or parts of trees to be removed and destroyed forthwith, employing all necessary aid for that purpose. The expenses for such removal and destruction of trees or parts of trees, to be a charge against the township, and for the purpose of said removal and destruction, the said commissioners, their agents, and workmen, shall have the right and power to enter upon any and all premises within their township.

SEC. 6. If any owner neglects to uproot and destroy, or cause to be removed and destroyed as aforesaid, such diseased tree or parts of trees or fruit, after such examination and notification, and within the time hereinbefore specified, such person shall be deemed guilty of a misdemeanor, and punished by a fine not exceeding one hundred dollars, or by imprisonment in the county jail not exceeding three months, or both in the discretion of the court; and any justice of the peace of the township where such trees may be, or where such nursery stock or fruit is sold, shipped, disposed of, or delivered as aforesaid, shall have jurisdiction thereof. The words "parts of trees," wherever used in this act shall refer to black-knot only and not to trees affected with yellows.

SEC. 7. The commissioners shall be allowed for services under this act, two dollars for each full day and one dollar for each half day, and their other charges and disbursements hereunder, to be audited as well as any other charges and disbursements under this act, by the township board all of which costs, charges, expenses, and disbursements, may be recovered by the township from the owner of said diseased fruit, or from the owner of the premises on which said diseased tree stood, in an action of assumpsit.

SEC. 8. All of act number one hundred and seventy-four of the public acts of eighteen hundred and eighty-one, be and the same is hereby repealed.

This act is ordered to take immediate effect.

Approved June 23, 1891.

CONSTITUTION

OF THE

MICHIGAN STATE HORTICULTURAL SOCIETY.

ARTICLE I.—NAME, TERRITORY, AND OBJECTS.

The name of the society shall be the Michigan State Horticultural society; and its territory shall be the state of Michigan. Its objects shall be the development of an adequate appreciation of the peculiar adaptation of the soils and climate of the state to the pursuit of horticulture in all its branches; and the collection and dissemination of information bearing upon the theory and practice of the same, as well as upon the arts and sciences directly or indirectly associated therewith, or calculated to elevate or improve the practice thereof.

ARTICLE II.—OFFICERS AND MODE OF ELECTION.

The officers of the society shall be a president, a secretary, and a treasurer, together with an executive board of six members, aside from the president, secretary, and treasurer, who shall be *ex officio* members of the said board.

Said board shall designate one of its members as vice-president. The officers shall be elected by ballot.

ARTICLE III.—A QUORUM.

Four members of the executive board shall constitute a quorum for the transaction of business at any meeting of said board: *Provided*, That each of the members thereof shall have been notified, in the usual manner of the time, place, and object of such meeting.

ARTICLE IV.—ANNUAL MEETING AND ELECTION OF OFFICERS.

The annual meeting of the society, for the election of the officers specified in Article II, shall occur on the first Wednesday of December in each year, and the officers then elected shall enter upon the discharge of their duties as such, on the first day of January next ensuing; but in case of a failure to elect at that time, such election may be held at a subsequent time at an adjourned meeting, or at a meeting of the society called for that purpose, in the usual manner.

ARTICLE V.—TERMS OF OFFICE.

The officers specified in Article II shall hold their offices until the thirty-first day of December of the year for which they were elected, and thereafter until their successors shall have been elected, and shall have signified to the secretary their acceptance: *Provided*, That the terms of office of the six members of the executive board shall be so arranged that but two regular vacancies shall occur in each year.

ARTICLE VI.—ANNUAL AND LIFE MEMBERS.

Any person may become a member of the society for one year by paying to the treasurer the sum of one dollar; and the yearly term of all annual memberships shall expire on the thirty-first day of December of the year for which they were taken, but be regarded as continuous, except as may be provided by the by-laws. Any person may become a life-member by the payment at any one time of the sum of ten dollars into the treasury of the society.

ARTICLE VII.—AMOUNT OR LIMIT OF PROPERTY.

The society may hold real and personal estate to an amount not exceeding twenty thousand dollars.

ARTICLE VIII.—BY-LAWS.

By-laws for the government of the society shall be framed, and when needful, amended by the executive board; but changes thereof may be at any time proposed by the society in general meeting.

ARTICLE IX.—AMENDMENTS.

This constitution may be amended at any regular meeting of the society by a vote, by ballot, of two thirds of all the members present and voting: *Provided*, That notice of such proposed amendment, specifying its purport, shall have been given at the last previous regular meeting.

BY-LAWS OF THE MICHIGAN STATE HORTICULTURAL SOCIETY.

I.—THE PRESIDENT.

1st. The president shall be the executive officer of the society, and of the executive board; and it shall be his duty to see that the rules and regulations of the society, and of the executive board, are duly enforced and obeyed.

2d. He may, in his discretion, and in the lack of needful rules during the recesses of the society and of the board, prescribe rules for the management of the interests or business of the society, such rules to continue in force till the next session of the executive board, and until by its action they shall have become no longer necessary.

3d. He shall act in conjunction with the secretary in the preparation of programmes, or orders of business for the sessions of the society; and in the devising of plans and processes for the maintenance of its interests.

4th. He shall have the best interests of the society at heart, and shall lead in forwarding any and all enterprises calculated to add to its permanency, or to increase its usefulness, and establish it more firmly in the public confidence.

II.—VICE-PRESIDENT.

The vice-president shall perform the duties of the president in case of the absence or inability of that officer; and may be called upon by the president to assume the duties of the chair at any meeting of the society or executive board.

III.—THE SECRETARY.

1st. The secretary shall be the recording, corresponding and accounting officer of the society, and he shall also be, jointly with the business committee, its financial and auditing officer.

2d. He shall incur no expenditure of a large or doubtful character except with the sanction of the executive board or of the business committee.

3d. He shall submit all bills or claims against the society to the business committee for approval, and indorsement to that effect, before drawing his order upon the treasurer for the payment of the same.

4th. He shall attend all meetings of the society, and of the executive board, and shall keep a faithful record of their proceedings.

5th. He shall sign all certificates of membership, and all diplomas and certificates of merit awarded by the society.

6th. He shall have charge of the society's books and papers, excepting only such as by the advice or direction of the executive board shall be placed in charge of the librarian, and he shall be responsible to the board for the safe keeping of the property placed in his charge.

7th. He shall be the custodian of the seal of the society, and shall have authority to affix the same to documents when needful.

8th. He shall seek, by all suitable means, to secure the fullest announcement of the meetings of the society in this state, as well as in adjacent states, when such shall be found desirable.

9th. He shall, as far as practicable, cause the transactions of the society, together with such valuable or interesting papers as shall be read at its sessions, to be properly published, and thus placed within reach of the state.

10th. It shall also be his duty, yearly, to prepare for publication the annual report of the society, together with such other matter as he shall deem proper—he being aided in the selection of such matter by an advisory committee of the executive board.

IV.—THE TREASURER.

1st. All the funds of the society shall be paid into the hands of the treasurer.

2d. He shall disburse the moneys of the society that shall come into his hands only upon the order of the secretary, countersigned by the president.

3d. He shall keep the moneys received by the society for life memberships as a distinct fund, and shall invest the same under the advice and direction of the executive board, applying only the interest accruing thereon to the purposes of the general fund.

4th. Immediately upon assuming his office, and before entering upon its duties, he shall execute to the society an official bond with sufficient sureties, conditioned for the safe keeping and disbursement of the moneys of the society, and for the proper discharge of the further duties of his office, in such sum as shall be specified by the executive board. Such bond shall receive the approval of the president, and shall be deposited with the secretary.

5th. He shall at the close of each year, report to the executive board the amount of money that shall have come into his hands during the year, the sources from which it has been derived, and the disposition made of the same.

V.—THE LIBRARIAN.

1st. The librarian shall have the custody of the library of the society. He shall be appointed by the executive board, and may be displaced at its pleasure.

2d. He shall act jointly with the secretary in the care and arrangement of the same, and in the reception, custody, and disposal of the volumes of transactions annually supplied to the society by the state.

3d. He shall have the custody of the rooms assigned to the society at the State capital, together with such books and other property as the society or the board shall direct to be deposited therein.

4th. He shall report annually, at the close of the year, to the executive board the amount and condition of the property in his hands.

VI.—THE EXECUTIVE BOARD.

1st. The executive board shall enact all rules and regulations for the management of the affairs of the society, determine the salaries of its officers, and assume the control and management of its exhibitions.

2d. It shall have power to displace any officer of the society for neglect of duty or abuse of position, and to fill all vacancies by appointment, to continue till the next annual election.

3d. The board shall hold four regular sessions during the year, to occur at the times and places for the regular meetings of the society.

4th. Other meetings may be called by the secretary, under the advice or direction of the president, or of a majority of its members, at such times and places as may be deemed most convenient; but in all such cases each member must be notified of the time, place, and object of such meeting.

5th. It shall be the duty of the board to carefully guard the general interests of the society, to watch over its finances, and to provide for its necessities as they shall arise.

6th. All important measures shall be submitted to this board, but they may by the board be re-submitted to the society with recommendations.

7th. The board shall, at the annual meeting submit through the secretary, in connection with the reports of officers, such further report upon the condition, interests, and prospects of the society as it shall judge necessary or expedient.

8th. Two members of the executive board are to be elected each year, to hold the office for three years, but if any such member shall absent himself from two or more consecutive meetings of the society, and of the board, without reason satisfactory to the board, the said board may, in its discretion, consider the office vacant, and proceed to fill such vacancy by appointment, to continue to the next annual election.

VII.—THE BUSINESS COMMITTEE.

1st. It shall be the duty of the executive board, annually, upon entering upon the duties of the new year, to appoint from their own number, three members, who shall constitute a business committee for the year.

2d. All accounts or claims against the society, when presented to the secretary for payment, shall, before payment, receive the sanction and indorsement of the business committee.

3d. Such claims shall be submitted to this committee and approved in duplicate; one copy to remain with the secretary as his warrant for the payment of the same, and the other to be transmitted by him to the president, along with his order upon the treasurer, as his warrant for countersigning the same.

4th. It shall be the duty of the business committee, upon application of the secretary, during the recess of the executive board, to advise with him as to the expediency of making any contemplated but questionable expenditure for which occasion may arise during such recess.

VIII.—STANDING COMMITTEES.

1st. There shall be a standing committee on revision of the catalogue, to be composed of one member from each of the five districts into which

the state is, for this purpose, divided, with one member chosen from the state at large, who shall be the chairman of the committee.

2d. Each member of said committee (except the chairman) is empowered and expected to choose a sub-committee for his district, of which he shall be chairman.

3d. It shall be the duty of each sub-committee to collect and report, each year, to the general chairman, such facts respecting fruit culture in the district as shall promise to be of value in the revision of the catalogue.

4th. There shall be a standing committee on new fruits, to consist of a chairman, with as many associates as such chairman shall find it desirable to appoint.

5th. Such other standing committees may from time to time be appointed by the executive board as, in its discretion, it shall deem desirable or necessary.

6th. All standing committees are expected to report at the annual meeting in December, any information of value to the society or its members that may have come to their knowledge during the year, as well as any scientific theories, deductions, or facts that, in their opinion, may be useful in advancing the objects for which the society is laboring.

IX.—LIFE MEMBERSHIP FUND.

1st. All moneys coming into the treasury of the society in payment for life memberships shall constitute a perpetual fund, to be known as the life membership fund.

2d. The principal of this fund shall be invested by the treasurer under the advice and direction of the executive board.

3d. All interest accruing upon any portion of said fund shall constitute and become part of the fund of the society devoted to the payment of its ordinary expenses.

X.—MEETINGS OF THE SOCIETY.

1st. The society shall hold its first regular meeting for the year during the month of January or February for the inauguration of the officers chosen at the annual meeting held the previous December, as provided in article IV of the constitution, and also to arrange its plan of operations for the year.

2d. Its second regular meeting shall be held in the month of June at such date as shall best accommodate an exhibit of the early summer fruits.

3d. Its third regular meeting shall be at its annual exhibit of autumn and winter fruits, in the month of September or October.

4th. Its fourth regular meeting shall occur in connection with its annual election of officers, on the first Wednesday of December, as provided in article IV of the constitution.

5th. The times and places for the occurrence of these regular meetings (excepting only the *time* of the annual meeting) shall be determined by the executive board.

6th. Other meetings may be called by the secretary, under the advice or direction of the members of the executive board, at times and places by them deemed expedient.

7th. In case of the calling of a special meeting for the election of

officers of the society, in consequence of any failure to elect at the annual meeting, as provided in section IV of the constitution, all persons entitled as members to vote at such annual meeting shall be considered as retaining such membership for such purpose until such election and until such officers so elected shall have been inducted into office.

XI.—RULES FOR DISCUSSIONS, ETC.

1st. The deliberations and discussions of the society shall be conducted in accordance with ordinary parliamentary usages.

XII.—AUXILIARY SOCIETIES.

1st. The society shall in all reasonable and proper ways encourage the formation of local horticultural or pomological societies auxiliary to this society in all such counties or other municipalities of this State as shall afford a reasonable prospect that they will be able, effectively, to maintain the same.

2d. It shall be the policy of this society in supervising the organization of such local auxiliaries to secure an identity of constitutional provisions throughout, and in so doing to insure harmony among them; but at the same time it will not discourage the including by them of special or local objects in cases in which such shall be found desirable, so long as the introduction of the requisite provisions therefor into the constitution and by-laws of the auxiliary society shall not be deemed likely to interfere with the harmonious workings of the whole.

3d. Any person may become a full member of an auxiliary society, for one year, by paying into its treasury the sum of one dollar; and a compliance with the provisions of clause fifth of these by-laws shall constitute him also a member of this society, for the same term.

4th. The wife, and the resident, single or unmarried daughters of any full member, may also become members of such auxiliary society upon the payment of fifty cents each: *Provided*, That in such case such entire family shall become entitled to a single copy, only, of the current volume of the transactions of this society.

5th. On receipt of the names of such members, with the required fees, the secretary shall immediately transmit their names and postoffice addresses, together with half the membership fee of each, to the secretary of this society, who shall record the same and pay the money into the treasury for the benefit of the general fund.

6th. It shall be the duty of the secretary, on receipt of such remittance, with list of members, to supply such auxiliary society with a certificate of membership in this society for one year, together with a copy of the current volume of transactions for each full member so remitted for.

7th. The proceedings of such auxiliary society shall, at the close of the year, be forwarded, in succinct form, to the secretary of this society, to be by him incorporated into the annual volume of transactions, accompanied by a list of its members for the year.

8th. The auxiliary societies shall, as far as practicable, be made the medium for the distribution of the annual volumes of the transactions of the society; the nuclei for its meetings, and the means of creating interest therein, as well as the means of collecting such facts or other information

or material as shall, from time to time, become needful or desirable in the conducting of its various operations.

XIII.—AMENDMENTS, ADDITIONS, SUSPENSIONS.

1st. Amendments or additions to these by-laws may be made by a majority vote of the executive board, at any meeting; but if objections shall be made the same shall "lie upon the table" till the next regular meeting of the board.

2d. These by-laws, or any one or more of them, may be suspended for the time, by order of a majority of all the members of the society present and voting.

3d. A proposition, in the general meeting of the society, for an amendment or addition to these by-laws shall be referred to the executive board for consideration and decision; but the society may submit therewith its advice or request.

4th. All amendments of the constitution and by-laws of auxiliary societies shall, before they shall take effect, be submitted to the executive board of this society, by whom their approval or rejection shall be considered upon the principle provided in section XII, clause 2, and the determination of said executive board shall be final and binding upon the auxiliary society.

PROCEEDINGS OF THE WINTER MEETING,

HELD IN LUDINGTON, TUESDAY AND WEDNESDAY, FEBRUARY 25 AND 26.

This meeting was held at invitation of the Mason County Horticultural society, and was designed to afford primary instruction, upon many points, to the large number of farmers of Mason county who had determined to engage in fruitgrowing.

The meeting was called to order by Mr. GEO. C. McCLATCHIE, president of the Mason county society, who introduced President LYON of the state society.

President C. G. WING, of the Ludington Business Men's association, made a brief address of welcome. He said this was the first meeting in Ludington of this society, or of any state society. Ludington has outgrown her first stage of development. It was not wholly satisfactory, for the prizes of commerce went to the few. Now the town is entering upon a second period, in which the rewards will be to the many. Mr. WING eloquently depicted the dawning of this better era, described the intense interest felt in fruitgrowing as an important feature of that coming better time, and closed by inviting the society to a banquet at the Elliott house the following evening.

President LYON said the time was when the chief business was to get rid of the forests, but now we begin to feel the need of replacing them and making money in an entirely different manner. The growing of fruit upon this lake shore began in Berrien county, and that was then thought to be the only fruitgrowing region upon the coast. But soon the industry spread to Van Buren county, then to Allegan, and now they have caught the fever clear to the straits of Mackinaw and even in the upper peninsula. When he came to Michigan in "the twenties," he had been led to suppose no fruit at all could be grown in the State. They used to grow peaches all over southern Michigan, however, though now they are found in but few localities; and the plum, also once common there, is now seldom seen. You have both the peach and the plum here, though I learned to-night that the latter is threatened by both rot and black knot. Fortunately for you, Lake Michigan is not likely to dry up right away; yet Mr. MORRILL will tell you he could do better if there were more forest in his vicinity. So it will eventually be here. More crops can be produced in a given region when it is half forest than when it is all cleared.

Owing to some misunderstanding as to dates, the local attendance was not so large as it was believed it would be tomorrow, and it was decided to postpone consideration of the programme and consider such questions as might be asked by those present. A good supply was soon handed in.

How shall I trim young peach trees?

MR. SESSIONS: I wish for a good, thrifty tree, with good roots, the top being not so much concern. Low heads to fruit trees of all kinds are desirable for many reasons. Cut so that the young tree will stand from $2\frac{1}{2}$ to 3 feet above the ground; trim off all branches close to the axillary buds. Allow the formation of no crotches and let the first branches be about two feet from the ground. Eight or ten branches may be left for the head of the tree. Trim the trees the next spring; though sometimes it is well to pinch back rank growth in summer. Remove one third of the first season's growth. Some do this work as early as March, but it is better to wait until severe weather is past. Cut back the longer branches furthest, so as to make a well-balanced head. This sort of trimming must be kept up to the end, to keep a compact, low head, yet opened enough to admit the sunlight and air.

MR. LYON agreed to this in the main, but would use only three or four side branches and a central one to build a top upon.

What kinds of peach are best adapted to Mason county?

MR. McCLATCHIE: The early sorts are all about alike and none are very good. Waterloo is here preferred as the hardest; next, Rivers, a not very good shipper; then Hale's. I am at a loss to know what to set for the next in order of ripening. Crane's is recommended. Early Crawford is good, of course, except that it bears freakishly, only when there is an abundance of other sorts. Barnard, Jacques, Snow's Orange, Chili, are all good, but the latter will bear more per acre than any other sort. Wagar is well liked, being better and earlier than Chili. It never fails to ripen. Smock ripens occasionally in favorable situations. Chili should not be set on light soil nor on heavy clay.

MR. SESSIONS: I would add Stump and Oldmixon, and to a limited extent Mountain Rose, though not a good shipper. We object to Wagar, in Oceana county, on account of its size, it being smaller than Chili. I have made more money from Hale's than any other. A few Alexander or Waterloo are well to have to fill out the season. They bring a fair price. I have a peach called Early Canada which I think as well of as any. Early Crawford and Barnard come at the season of gluts, when prices are low, and so I would plant but few of them.

MR. MORRILL: If I wished to give my crop a bad start in the market I would send such peaches as Amsden and Alexander and such grapes as Champion. They will ruin you if you put your name upon the packages.

MR. LYON: Some do not care to plant wholly for the market, desiring fruit for home use as well. Those who do will take none of these. Another class of peaches, better in quality though smaller or less hardy, are the Rivers, Louise, George IV. Coolidge's Favorite, Susquehanna (when you can get it), and others.

MR. McCLATCHIE: I would add Wagar to this for quality.

MR. J. FITCH of Ludington: Wagar is of excellent quality and especially so when canned.

MR. LYON: Wagar is reckoned a market peach and valuable because of reproducing itself from its pits.

When is the best time to trim trees, and how?

MR. LYON: There are different practices with different fruits; but cut no branches unless necessary, after growth has begun. Yet summer pruning conduces to fruitfulness. Otherwise do the work before the sap

moves. Never prune in the fall if you can do it in winter or earliest spring. Cutting limbs at all is an injury to the tree. Trees pruned in winter will not start so well as when the work is done in very early spring. It is dangerous to prune the cherry after it has come into bearing, and it will never do to cut large limbs. The best way is to have a model for your trees and pinch back the young shoots to suit it. The same is true as to the plum. The pear and apple bear pruning almost equally well.

To this Mr. SCOTT agreed, but said care must be used in pruning the pear, or blight will be carried.

Mr. J. B. HOUK of Ludington: Would cut back young peach trees severely when setting and again the next spring.

Mr. MORRILL warned against the formation of too low heads, as the borers will get into crotches that are near the ground; and allowance must be made for getting under the trees with sheets in jarring for curculio. Cut back to three feet in height when setting and trim "to a whip-stalk," pruning off undesirable limbs by rubbing off the shoots with the hands. Then form the head a little heavier on the side toward the prevailing winds in order the better to balance the top.

Mr. SESSIONS: Care must be exercised here to not head too low because deep snows and crust will break down the limbs. So head at $3\frac{1}{2}$ to 4 feet in sags of the ground but lower on the summits.

Mr. LYON advocated low heading because it affords shelter from the sun and wind to the trunks. Borers never attack the shaded parts of trees.

What kinds of peach do best on high, sandy land, well air-drained?

Mr. MORRILL: The Hale must have such a location, as must also any sort disposed to rot; in general the white-fleshed peaches.

Mr. LYON: This is true, yet in the great mass of varieties there is very little difference. Chili will do as well on such a soil for a time, but I doubt if it is as long-lived there as on heavier lands. The finest color and quality in fruits are obtained on light soil, but greater firmness is obtained on heavier lands.

Mr. PAYNE of South Haven: Put the earlier sorts there, because they will ripen and get out of the way of drouths and be less likely to rot.

Mr. MORRILL: There would be less complaint of Hill's Chili were it properly thinned.

It is a prevailing idea that peaches do not do as well upon the immediate lake shore as two or three miles back from the water. If so, why?

Mr. LYON: It is true that a little back from the lake the fruit is a little earlier; but it is also more liable to injury by frosts in the spring. Trees do as well close by the water except as they may be influenced by elevation. Other things being equal, they do as well next the lake, except that they are a little more subject to leaf-curl. But the land is usually a little lower next the lake than it is a few miles back.

A variety of opinions was expressed, but it was generally conceded that locations close to the lake are as good as those further back unless they had some special disadvantage.

What varieties of the pear are suited to sandy soils?

Mr. MORRILL: Bartlett seems to do well.

Mr. LYON: Very few sorts do better on sandy soil and it is doubtful if any do best there.

Adjournment was made until 8:30 o'clock, A. M.

Wednesday Morning Session.

Wednesday morning it was decided to take up first, out of the prescribed order, the subject of small fruit culture, pending which Messrs. GEO. C. McCLATCHIE and J. B. HOUK told of the beginnings of fruitgrowing in Mason county. They had better success after the forests were cut off than before; they at first set varieties that were unadapted to the locality, and for a time feared theirs was not a peach-growing region, but latterly they had been more successful and now believe they grow as fine peaches as any on the shore. Seventeen years ago the mercury went to 21° below zero, but the country was then uncleared. Since that time it has not been more than 6° below.

WORK WITH SMALL FRUITS.

Mr. R. MORRILL of Benton Harbor, read a paper upon Cultivation of Small Fruits, which was withheld from publication.

He was asked, Would you grow blackberries without laying them down in winter? In reply to this and a question about strawberries, he said: I grow only Wilson and Early Harvest blackberries and I lay them down. It costs but \$3 to \$6 to lay them down, making the expense of protection about \$10 per acre, and it pays. Among strawberries, Wharfield No. 2 outsold everything upon the Chicago market last season. It is more uniform and regular in size of fruit than any other; is heart-shaped, deep red, with tough skin and solid flesh, which retains its lustre; it is very productive and has succeeded in Illinois as well as in Berrien county; by way of comparison, it is like the large Wilsons of years ago, but with more skin surface and less seeds.

Mr. C. W. GARFIELD commended the Long Bunch Holland currant. It is grown very successfully in Wisconsin.

President LYON had a good opinion of the Wharfield strawberry from his one year's trial of it. He grew it in narrow rows (eight to ten inches in width and the plants not close) using potted plants. This year he will have the rows 2½ to 3 feet wide. It has been so grown in Illinois four years, and with success. Wharfield and Wharfield No. 2 are the same so far as fruit goes, No. 1 being a pistillate variety for fertilizing No. 2.

Messrs. LYON and MORRILL protested against the practice of introducing fruits by number, because it leads to confusion and nothing is gained by it.

Mr. MORRILL: In laying down blackberry canes I employ two or three men. One goes ahead with a round-pointed and long-handled shovel and digs under the canes six inches or so; the second man pushes them over, and the third throws on earth to hold them down. In case of the Wilson, I cover the canes entirely with earth, taking care not to crack nor sharply bend them, as to do so prevents ripening of the fruit. In the spring, throw them up again with a fork and replace the earth. Then, after rain has cleaned them, I do the trimming, cutting back four to six inches. I do not simply nip them, for in doing so one would often leave a terminal bud that would run up at the expense of the laterals. A knife is better than shears for this work, being of more rapid action.

CHOICE AND TREATMENT OF NURSERY STOCK.

Mr. A. G. GULLEY of Michigan Agricultural College: Were I about to select stock for a large apple orchard, I would find what varieties were suited to the locality and then correspond with reputable nurserymen to learn the cost. The cheapest offer would not necessarily be the best one to accept, nor need the price per tree be the same for each variety. Apple trees should not be more than two or three years old, else they can not be headed low enough. Pear and plum stock should not be more than one year old, for the same reason. "Extra size" and "bearing age" stock are humbugs. Stock which nurserymen offer at a sacrifice, as a rule should not be taken, though this is not always the case, especially with peach stock, in which there is often a change of fashion in varieties. An objection to Maryland or Delaware peach trees is their liability to yellows. The trees are usually large and fine looking, but yellows is prevalent everywhere in that region and the nursery stock is very likely to be infected. No better peach trees can be had than those grown in Michigan. They are stockier and have better roots, but up to date we have not grown enough to supply the home demand. I would choose Ohio trees next. Those sold from Rochester, N. Y., are not grown there and the varieties are not what we want. This does not apply so much to apples. As a rule buy your stock in the fall; yet if you buy in New York, you are not likely to get good roots on fall-dug trees, pear especially, though late fall orders may be good in this respect, because the rush of the season is then over and you may get trees that were not "stripped." Heal them in rather than keep them in a cellar. By the latter process the roots are likely to become dry. Place the roots in a trench, lay the tops down and bury them half way up. Take them out early and stand them up, if not ready to plant; but it is best to plant early.

Mr. GARFIELD: Myself and a neighbor were about to join and buy some nursery stock. But the neighbor wanted to buy of a big house because he could get the stock a little cheaper. He did so, while I bought of a smaller firm I knew, paid a little more, and got far better trees. My neighbor had trouble in setting, for the trees were of bad quality and there were miscounts in the numbers.

Mr. MORRILL: Too many growers are unbusinesslike in buying trees. They too readily take the word of agents and buy of them instead of corresponding with nurserymen or learning at such meetings as this. They let the dealer plan their business, and the dealer buys up cheap surpluses of any sort and labels them according to his orders. Some nurserymen will not keep an agent in one place more than three years. Then they shift agents, and the new man claims his predecessor was discharged because he was tricky. A man who is swindled in buying apple trees is swindled for ten years. So I advise, never buy of an agent nor a dealer. You can easily get into communication with honorable and reliable nurserymen. Never permit substitution.

President LYON indorsed these ideas. He has never bought a tree of an agent and probably never will buy one. Go or write to good nurserymen, and have the variety you want or take nothing. Avoid getting very large trees, simply because they are large. Head them low.

Mr. GARFIELD: First-class one- and two-year-old trees can not be had for much less than three-year prices.

Mr. J. B. HOUK of Ludington: I am out \$30 on "ironclad" and "extra

size" stock. One year I paid \$5 for five peach trees and \$1.50 each for apple trees, but no such stock ever grew. Somehow ordinary-price trees always grow.

VALUE OF HORTICULTURAL SOCIETIES.

Mr. MORRILL urged the importance to fruitgrowers of organization into societies for discussion and investigation. Send delegates to state and district meetings. Don't try to "go it alone" and be subject to the wiles of every swindler. He spoke of the great value of the reports of this society for practical information, saying they have become famous as equal or superior to any similar works in the United States. No fruit-grower can afford to stay out of the societies, and they should be liberally encouraged by business men.

PEAR CULTURE.

Mr. EVART H. SCOTT of Ann Arbor led in discussion of this subject, saying he would first consider the orchard. High ground is preferable, with a north or west slope, and with heavy soil, or at least heavy subsoil. The trees should never be over two years of age when set, and one-year trees, or two-year roots and one-year stems, are better. Plow the tract as deeply as may be done; dig holes two feet in diameter and 18 inches deep, placing some of the upper soil in the bottom, but have no manure close to the roots. Crop with corn or potatoes for seven or eight years, and then leave the land to the trees, but plow and cultivate occasionally.

Plant a dozen sorts for home use—Madeline, Doyenne d'Ete, Sterling, Clapp, Bartlett, Flemish Beauty, Bosc, Seckel, Sheldon, Belle Lucrative, Rostiezer, and Lawrence. The early varieties are the more profitable. For market set Clapp, Bartlett, Howell, Onondaga, Bosc, Anjou, Lawrence, Kieffer. The latter may be grown for profit. I have never gotten it ripe, but it colored up and—and—sold!

Pick pears before they are fully ripe, as soon as the stem separates readily from the branch. Place them in a dark room to ripen, for home use, but pack and ship at once for market. I would not recommend Flemish Beauty for market, because it ripens about with Bartlett and sells for only half so much, although it is of better quality. Give ventilation to the barrels by cutting slits lengthwise in the sides. Pack, as other fruit, of uniform quality throughout the barrel.

I would not set dwarfs, except Angouleme and Louise. Sheldon is one of the best of pears, but until lately it has not been properly known in the market. Clairgeau is a beautiful pear, and sells well in market, but unless thinned the fruit is small and poor.

Mr. LYON: The Kieffer can be recommended only because it is tolerable when cooked with plenty of sugar. If Ann Arbor is too far north for the Kieffer's ripening, certainly Mason county is. Sterling is good as a grower and bearer, and in quality; is very sweet, like Flemish Beauty in flavor, but a good keeper; is likely to prove to be good for market; have never known it to blight; nurserymen dislike to grow the trees because they are crooked.

Mr. GULLEY: I have had difficulty in getting Bosc trees. The best way to obtain them is to set other varieties and top-graft them, as

they will then be straighter. It is proving to be one of the best pears for Michigan.

Mr. GARFIELD: Some one has said the Anjou is good because it comes later than "the other Bartletts."

Mr. MORRILL: In the Chicago market they are known as "Winter Bartletts" and are now selling for 75 cents to \$1.00 per dozen.

Inquiry was made concerning the Wilder. Mr. SCOTT had not fruited it and knew of it only by the claims of Mr. GREEN, its introducer. Mr. LYON had seen the fruit and thought it better than most varieties of the season ascribed to it, but knew not what its season would be in Michigan. It is not yet safe to plant it extensively, but well to try a few.

Mr. MORRILL: Recollect, as to early pears, they are still earlier south of you. I have seen 2,000 packages per night sent from Benton Harbor in the Bartlett season, and the price went down to fifty cents per bushel. Early pears here may meet the Bartlett season of further south, and in the market Bartlett is king. Anjou is a good pear for market, though not so early a bearer as Bartlett. It keeps well and should be satisfactory in Mason county.

SPRAYING AND JARRING.

Mr. GULLEY said these subjects had been so fully covered and reported at the recent meeting at Hart that there was no necessity for repetition. Spraying apples for scab had been tried, carbonate of copper and ammonia being used successfully, especially upon Spy.

Mr. H. F. ROBINSON of Ludington asked about pear blight, having been troubled by it.

Mr. SCOTT: Cut off six inches (one foot is better) below the blight, dipping tools used in carbolic acid after each cutting, and burn the infected branches.

Mr. MORRILL: In jarring, injury has been done by striking with a mallet. Parker Earle advises the driving of spikes into the trees, upon which to strike with the mallet.

Mr. ROBINSON: A stick with a concave end, padded, with which to suddenly push against the trees, is better than jarring.

Mr. GEO. C. McCLATCHIE of Ludington preferred spikes or bolts.

Mr. LYON: The more sudden the blow, the more surely will the curculio be surprised and drop. Therefore spikes are preferable.

Several decried spraying for curculio, but Mr. W. H. PAYNE of South Haven maintained its effectiveness, as curculio do feed upon the foliage, as has been proved by observation. Decrease the strength of solution each time, and use even before the blooming. It has been proved, also, that curculio are killed by spraying. It should not be abandoned from one season's experiments. It kills the newly hatched larva in the crescent marks as it does the codlin moth in the apple calyx. In thirty-six marks examined, on sprayed fruits, but one live larva was found. Probably an egg had been laid in each case.

Wednesday Afternoon Session.

President LYON announced the following committees:

On Exhibits—Messrs. R. MORRILL, A. G. GULLEY, W. H. PAYNE.

On Resolutions—Messrs. C. W. GARFIELD, C. A. SESSIONS, and ILGENFRITZ.

Mr. SMITH HAWLEY of Summit township, Mason county, read the following paper upon

FRUITGROWING IN MASON COUNTY.

Fruitgrowing in this county may truthfully be called an "infant industry," for, although there are a few quite old apple orchards scattered over the county, here and there, yet the business of general fruit culture is just beginning to be developed. That the business will prove very remunerative is shown by the fine fruit grown, the prices that have ruled, and the success of those who have engaged in it.

In considering the present state and future prospects of this favored locality, for the production of fruit, we must first take into consideration the soil and climate; and secondly, the location as regards markets. Although there are plenty of heavy lands in this county, well adapted to general farming, the soil in what is known as the fruit region ranges from a light sandy loam to a heavy clay loam, with plenty of gravel and limestone mixed through it, affording every variety of soil for the production of every variety of fruit. The face of the country is rolling (hilly in places), giving the most perfect air drainage as well as water drainage; and as to the climate, people living further south will often wonder that a fruit so delicate as the peach can be successfully grown so far north and be a failure the same year much further south. The cause is very largely due to old Lake Michigan, which stores up the summer's heat and holds it for our benefit, so that when, further inland, the mercury slides down to the bottom of the tube and there congeals, and peach buds are killed. Near the shore the heat stored up by the great lake is felt to such an extent that the mercury has never gone down more than 8° below zero, at my place, in 14 years, so that the peach buds are safe. This climate and soil are also specially adapted to the successful culture of small fruits, the success of some of our growers bordering upon the marvelous, and yet we have seen only the beginning. Apples, pears, plums and cherries can be successfully grown throughout almost the entire county; and when it is stated that over fifty thousand fruit trees were planted in this county in the spring of 1889, some idea can be formed of the great interest that is taken in fruit culture, and the coming spring will witness a still larger setting. Nature has placed here soil that is adapted to fruit, and the great lake to assist in raising and protecting it.

There are thousands of acres yet that are the best of fruit lands, that need only enterprise, intelligence and energy to make them yield bountiful harvests of the finest fruit, and hundreds of acres are yet in a state of nature, covered by the primeval forests, and only waiting the hand of man to bring them into subjection.

Already the business of shipping apples, pears, plums, peaches, and cherries and all sorts of small fruits from Ludington has assumed large proportions, and when the fact is taken into consideration that less than ten per cent. of the trees now growing are yet bearing fruit, to say nothing

of those to be set in the near future, some conception can be formed of the coming extent of the trade. That Ludington is destined soon to be one of the great fruit-exporting cities is an assured fact, and that it is so regarded by outsiders is proven by the large number of buyers who came here last year after fruit.

And now as to markets. Our proximity to the best harbor on the shore gives us the best of facilities for shipping fruit by water, and the same old lake that has saved our fruit from winter's chilly blasts, from hail storms, blizzards, and tornadoes (from these we are exempt) carries it on her bosom to all the western and northern markets, keeping it cool on its passage and carrying it without jar or jolt, thus placing the best markets of the country at our very doors; for fruit can be, and is, picked in the afternoon, shipped the same night and placed on the markets of Chicago, Milwaukee and Manitowoc the next morning, less than twenty-four hours after picking, thus putting our fruit on the market as fresh as it left the orchards, insuring quick sales and good prices. We have also the best of railroad facilities for shipping east and north, and reaching all parts of the state. There is, in fact, no fruit-raising section in this state that has access so quickly to so many and such good markets as we have here at command.

It will thus be seen that we have here soil adapted to the raising of fruit, a climate that insures a good crop, and the choice of the best markets of the country, a happy combination of conditions rarely enjoyed by one community.

The greatest need of the fruitgrowers here is a better knowledge of our business, and to attain this knowledge no stone should be left unturned.

A question was asked as to the relative value of light and heavy soil. Mr. SESSIONS believed a medium between the two to be preferable for peaches, but the heavier soils were best for all other kinds of fruit. On light soil a fruitgrower can make more money from peaches than from anything else.

Which is of the more importance, soil or air drainage, was asked?

Mr. C. A. SESSIONS of Mears: We can improve the soil but we can not hold the warm air. Mr. LYON answered to the same effect; degree of elevation is not so important as chances for the cold air to flow off to lower levels.

Mr. McCLATCHIE: It is relative height rather than excessive height.

President LYON then read the following paper upon the general subject of

THE APPLE.

This fruit will succeed on almost any soil suitable for the production of grain crops, although on very light soil, under ordinary treatment, the trees will be likely to sooner exhaust its fertility, and for that reason to prove shorter lived.

This tree proves more patient under adverse conditions than most others; still, as is equally true of others, it will repay starvation by starving the owner, and will repay sodden soils and "wet feet," with light crops, indifferent fruit, and disease. It is not a native of our climate, but is believed to have developed, under thousands of years of artificial treatment and reproduction from seed, from the indigenous wild crab of Europe.

Under the fervid summers and arctic winters of America, when not mitigated by the equalizing influences of large bodies of water, the tree is often lacking in hardiness; but, thanks to our lacustrine conditions, here in the fruit belt, this liability is less serious with us than is the case further west. Still, even in Michigan, the bark of the trunk, when fully exposed to the sun during the heat of the day, and anon subjected to severe freezing, frequently becomes so far diseased as to invite the attacks of the borer, to the serious injury and often the final death of the tree.

Such attacks never occur except in positions open to the sun. Such being the case, the obvious preventive is the shading of the trunk. This may most readily be done by branching the trees very low; by which means the stress of the wind upon the tree and the loss of fruit when in bearing, will be in a good degree avoided; while greater convenience in gathering the crop will be secured.

Prune as little as possible, always with a well-defined ideal in mind; not a precise model, to which all are to be brought, for the reason that varieties vary in habit, while such tendency can not well be overcome; but it should rather be a general plan for providing a foundation for the head and building the superstructure thereupon. With such ideal in mind, the pruning can be mostly done with the jack-knife. Pruning to direct growth is always to be done when the tree is dormant; to check growth, or to hasten or increase fructification, in summer.

VARIETIES FOR THE FRUIT GARDEN.

This branch of the subject has reference more especially to city, village, and suburban residents, with comparatively restricted grounds, who for this reason must limit their planting to varieties which are less likely to be supplied from the market in satisfactory quality and condition.

Dwarf trees are often recommended for this purpose, since they will require less space and therefore admit of greater variety; but in planting these we will soon discover that we have a pretty but expensive plaything, of very little value so far as fruit is concerned. In these remarks we have reference mainly to trees worked on Paradise stocks, which rarely get beyond the dignity of bushes and must have high cultivation and special care. Doncain stocks, which are more common, can only by courtesy be called dwarfs, as they afford little if any advantage in this respect over what are known as free stocks.

Beyond a variety or two, strictly for culinary uses, such as Early Harvest, Red Astrachan, and perhaps Keswick Codlin, the planter should by no means blindly accept the selections of the commercial orchardist, but should rather forage among the varieties which, from excessive delicacy of texture, deficient size, or unattractive color, are unfitted for the market, and yet possess just the gustatory qualities which most fit them for a place upon the table of the discriminating lover of fruit in its most perfect condition.

SELECTIONS FOR THE FAMILY ORCHARD.

The ideas already put forth respecting selection of varieties for the fruit garden, only require amplification to adapt them to the case of the family orchard, since, in the latter case, the supply of this fruit is expected to cover the entire year, as it may readily be made to do if properly

devised, and by no means necessarily expensive arrangements are made for the keeping of fruits in a room separate from vegetables, with simple and easily managed devices for controlling the temperature.

The adaptation of the orchard to the purpose specified, and its ability to supply fresh (uncooked) fruit at all times, as an article of diet, as distinguished from culinary uses, is mainly a question of varieties. People generally are so accustomed to measure the value of everything by dollars and cents, that it is too commonly the custom to choose a variety of fruit by its popularity in the market, which usually means its fine appearance and ability to bear rough handling, rather than the flavor, juiciness and delicate texture which, while they to some extent unfit it for the market, are yet precisely the qualities most valuable in a dessert fruit for home use.

True, many if not most farmers wish to plant for a home supply with a surplus for market—by no means a difficult matter, since the difference between dessert and market varieties mainly disappears in the longer keepers, of which the surplus should mainly consist.

The papers of the day, as well as the discussions of societies, are replete with the cry, "Too many varieties!" This is, beyond question, an idea not to be overlooked in the planting of a commercial orchard; but we venture the remark, without fear of successful contradiction, that it should have but slight influence in the make-up of the family orchard. Such a plantation must include sweet and acid, culinary and dessert fruits, each covering the different seasons. It is also true that tastes differ, and that, to meet these varying needs, a very considerable number of varieties will be found indispensable.

For a plantation of this character, we suggest such varieties as Early Strawberry, Primate, Summer Rose, Early Joe, Jefferis, Lowell, Dyer, Fall Pippin, Shiasawsee, and Melon, to be planted in quantity sufficient only for home use, with Jonathan, Rhode Island Greening, Northern Spy, Red Canada (as a top graft and only where known to succeed), also Golden and Roxbury Russets, with reference to a surplus if such is desired. We would by no means overlook the Baldwin, although an occasionally severe winter is likely to seriously injure or wholly ruin it, in many localities. For the purpose under consideration a few varieties of sweet apples will be indispensable. Among such we suggest Sweet Bough, Golden Sweet, Jersey Sweet, Ramsdell's Sweet, Bailey Sweet, Talman Sweet, and Lady's Sweet, as affording a good and full succession for the year.

COMMERCIAL ORCHARDS.

There are two general purposes for which these are planted.

1. For the supply of a local market, conveniently at hand, and for which a continuous succession of varieties is indispensable, and for the making up of which the objection of too many varieties, has but a modified application. In selections for such purpose, culinary varieties, such as Red Astrachan, Maiden's Blush, Gravenstein, St. Lawrence and showy, firm, long-keepers generally, figure largely.

2. When intended more especially for wholesale purposes, the too-many-varieties objection finds its fullest and most appropriate application, since there can be no doubt that, with a wise choice of varieties, a lot of fruit of very few kinds, will command better prices than can be realized for a mixed lot. In such a plantation, as the rule, summer and autumn

varieties should find little or no place; and, since most winter varieties possess the requisite handling qualities, the selection of varieties depends very largely upon the vigor, hardiness, and especially the productiveness, of the tree.

THE MARKET APPLE.

Under existing circumstances, one of the first and most essential qualities of a market apple is ability to withstand the outrageous abuses of express and freight employes, abuses which might doubtless be remedied, or at least greatly lessened, if fruitgrowers could be induced to bring their combined influence to bear, forcibly, at the headquarters of the responsible parties.

2. The color should be clear, bright, and attractive, since in most markets buyers give more attention to beautiful appearance than to quality.

3. Apples of good, medium, even size, both handle and sell better than those very large or too small, for the reason that, especially upon fruit-stands, small fruits will not command attention, while large fruits yield fewer specimens to the bushel, yet fail to command a corresponding price.

4. The quality should not be too low, since, although most consumers who buy in the market are not critical, so far as quality is concerned, disappointment in this particular will surely induce a diminished consumption, if not also a resort, instead, to the sub-tropical fruits with which our markets are now so constantly and cheaply supplied. Few buyers are likely to repeatedly patronize a Pennock or a Ben Davis fruit stand, while at an adjoining stall he can obtain oranges, pine apples or bananas at moderate prices, while the same is also true of hotel and even family tables. In the cases of Red Canada, Northern Spy, Jonathan, or Hubbardston, and especially of Shiawassee and Melon, this tendency will be almost if not altogether reversed.

Mr. ROBINSON asked as to the proper time for pruning.

Mr. LYON: Two purposes are served by pruning, but you can not have too little of it after you have secured the requisite form for your trees. The preferable time is earliest spring or late winter; by all means before the sap starts. If pruning is done to force fruitfulness, it should be after the leaves start but before the time for formation of fruit buds. Never cut large limbs if you can avoid it; but, if you do, protect the ends with paint or shellac in alcohol. There is not much danger of large limbs rotting to the heart if cutting is done at the right time, yet it will sometimes occur. Shellac affords better protection to cut surfaces than anything else, unless it be paint. Ordinary paint cracks, so it is best to repeat application of it.

Mr. MARSH: I have often noticed orchards which seemed unpruned and "craggly" in shape. Would not such better be pruned? Neglected orchards are often such merely from infertility. If this state results only from lack of judicious pruning, it should of course be practiced. Four or five laterals and one central branch afford the best form.

Mr. PEARSALL: The cut large limbs will rot some at the surface but be sound beneath. It is better to cut such limbs close to the tree than out a few inches.

Mr. SCOTT: These things are for neglected orchards only. There is no need of having such limbs if trees are started right in the first place.

Mr. LYON: Thumb-pruning is the best kind, but only a few growers will practice it.

Replying to a question, Mr. LYON said, put the Wagener graft so far down that it will root. The tendency of the Wagener to sprout up from the root may be obviated by top-grafting.

Mr. GULLEY: The Baldwin may possibly be made more hardy by top-grafting, but I never saw it accomplished. For such purpose the Spy, Golden Russet, or some of the hardy western sorts would do well.

Mr. MARSH: Can the recent importations of Russian varieties of apple be recommended for this region?

Mr. LYON: They are yet too recent. I am trying some of them but have no results upon which to base judgment. They are all hardy enough, but so far all are summer or early fall varieties, and it is doubtful if a list of keepers can be made from them. They suffer from blight in the west but are likely not to do so here. There are some promising native seedlings in the west. But it is needless to seek either these or Russian varieties for planting in a climate where peaches may be grown. There are varieties that may be grown here and which are better than any Russian sort.

Asked if the Baldwin apple would do well on clay, Mr. LYON said, there probably is no apple that will do better than the Baldwin on light soil, but it will do well also upon heavy soils well drained.

Mr. MORRILL and Mr. PEARSALL called attention to the fact that all such information about varieties may be obtained from the fruit catalogue of this society, printed biennially in its reports.

Mr. GARFIELD enlarged upon the merits of the Shiawassee apple. It is so delicate and refined in quality, and so high and beautiful in color that some one has aptly called it "the strawberry of winter." The tree is a fine one, and for all its merits it should be generally planted.

Mr. J. N. STEARNS of Kalamazoo, who has an extensive plantation of the several kinds of fruit trees, etc., at South Haven, read the subjoined paper upon

PEACH GROWING.

The first essential is the selection of a proper locality for planting; and this is of great importance, for if all other important essentials are carefully looked after and you have not suitable locality it will prove a failure.

My experience is, that peach-growing can not be made a success on ground that is naturally cold and wet, no matter how thoroughly drained. I made a mistake in this direction for several years.

The best location for peach-growing is good soil (it may be either sandy loam or clay loam) lying sufficiently high to have good natural drainage. If along the fruit-belt of lake Michigan, it will be found better if sloping toward the lake. If in the interior of the state, only the highest points of land should be selected, prepared the same as the best preparation for a crop of corn.

The soil should have been cultivated to some hoed crop the previous season. If clayey soil is selected, subsoiling will be found of great benefit.

The next in importance is the selecting of good, healthy trees that have been properly handled; and let me here put in a word of caution. The

strong tendency in the planter at the present time is to buy of the party who will offer trees the cheapest. This is a great mistake. First, be satisfied the nurseryman is a conscientious person in his business and understands the same. When he is found, you can rest assured the trees have been handled with care so the vitality is perfectly preserved. One such tree is worth a half-dozen half dead by exposure. It is plain to be seen, this nurseryman can not afford to do this for nothing. I can assure the planter he had better pay a fair price for such stock than to plant much that is offered, even if furnished for nothing.

I do not wish to be understood as recommending paying the exorbitant prices of tree peddlers; but buy of a nurseryman with a good reputation, the same as you would if you were buying blooded stock of any kind.

The best trees to plant are not the largest, as there is too much wood to keep alive, but the medium size with good roots.

PLANTING.

Be sure to dig a hole of sufficient size to take in the roots without cramping, and deep enough to admit the tree about an inch deeper than it stood in the nursery. Fill in about the roots with fine surface soil, enough to cover all the roots, taking care that it is sifted all through between the roots, putting back, say, two thirds of the soil; then tramp down firmly, turn in one half pail of water, letting it settle away around the roots; then fill in the rest of the soil without tramping.

Trees planted in this way will stand for weeks in good shape if there should be no rain.

Thorough cultivation should be given to the end of July, after which the ground should not be stirred or the wood will not properly ripen.

I have known a young peach orchard to be nearly ruined by digging potatoes in the same in September, stimulating a late growth, which caused the trees to go into winter soft and they were badly winter-killed.

SELECTING VARIETIES.

I have come to the conclusion that it will not pay to plant anything earlier than Hale's Early. Although I have many of the earlier sorts, I wish they were all out and something better in their place.

I would recommend about the following list for 1,000 trees: Hale's Early, 50; Lewis' Seedling or Mountain Rose, 50; Richmond, 100; Snow's Orange, 100; Jacques Rareripe, 100; Kalamazoo, 300; Golden Drop, 200; Smock, 100.

In this, I put in no white peaches that ripen after yellow peaches come, as the latter always sell best.

The Kalamazoo is comparatively a new peach to most fruitgrowers, but I have fruited it for fifteen years and am fully satisfied, taking all in all, it is the best peach we have on the lake shore. In fact, I have been so thoroughly convinced of it that I have planted nothing else for the past two years. I know of no genuine trees to be had at this time, but plenty were budded last fall.

It will be asked by some, why I have left out the Crawfords? My answer is, they are not reliable. They have given only about two full crops in the last ten years, while there have been eight full crops of the varieties named above. I put Richmond in place of Crawford's Early, as

it is similar and much more hardy although not quite so large. Were Crawfords reliable, I would plant very largely of them.

PRUNING.

This should be done annually. We usually do it the last of March or first of April. Care should be taken that no crotches are allowed to form, as they are about sure to split down with the first heavy crop.

THINNING.

Too much stress can not be placed on this, both as a matter of economy and profit, for it certainly does not take nearly the time to pick off the small green peaches, and drop them on the ground, that it does to handle the same peaches when ripe and only half size.

Quality is everything in a peach, and this can never be secured when the tree is greatly overloaded. The temptation is very great, and especially to the new beginner, to want to see his young trees loaded full. But for the good of the tree, if nothing more, thin out so no two peaches will be nearer than six inches.

MARKETING.

Out of the large crop of one year ago last season, or of the lighter crop of last season, we did not ship a bushel of first-class peaches to the great market, Chicago. Nothing went there from our crop except the culls. The commission man will not discriminate between No. 1 and culls in his returns.

My best fruit is used in filling orders on which I make the price. Now, I do not suppose every fruitgrower can do this from the start, but I am satisfied that all who will be careful in their packing, to have every package just what it purports to be, will very soon have a demand for all the choice fruit he can grow. At least, I have found it so, and I have been in the business for over twenty years; and every year I find myself less able to fill all the orders I receive. But I can say this to any grower, it will require personal vigilance to accomplish this end.

THE CURCULIO.

The following has been my mode of fighting the curculio for the past ten years, which has proved very satisfactory: I use fresh stone lime. Put one bushel in a box, sprinkle on about one third pint of crude carbolic acid, then throw on just water enough to slake the lime so it will be perfectly dry dust. A little practice will teach you the amount of water. It should stand about twenty-four hours to become thoroughly slaked. As soon as the blossoms fall, this is thrown into the trees with a paddle (made of a shingle), in the morning while the dew is on the foliage, and after it has dried it will stay on through quite a hard rain but should be repeated as often as washed off, until the fruit is two thirds grown. I have imagined that the lime and acid were worth all they cost, to the trees in keeping off all other insects and fungi, even if it had no effect on the curculio, as I know fruit so treated was less liable to decay.

CHERRIES.

What has been said with regard to the cultivation and management of peaches is equally applicable to the cherry, even to the use of the lime. One exception, perhaps, might be mentioned, and that is pruning. The cherry requires but little pruning, just enough to prevent limbs crossing and the trees becoming too thick.

In my experience I have found but three varieties that will pay to grow for market, and they are all sour: Early Richmond, Montmorenci, and English Morello, mentioned in the order of their ripening.

There are some of the sub-acid and sweet cherries that are very fine for eating. I will mention my choice of these: Belle de Choicy (of the Duke class), Gov. Wood, and Black Tartarian (of the Bigarreau type). The two former are very hardy. The Tartarian is rather tender for a cold section.

Mr. ROBINSON. Peachgrowing is becoming a very important industry in Mason county. I notice a tendency to head the trees too high. Pruning should be so done as to form a low and symmetrical head.

Mr. QUACKENBOS: Is Crane's Early Yellow a desirable variety?

Mr. GULLEY: It is one of the new and hopeful kinds; yellow, ripening at the season of the Lewis, to which it is preferable; and it is hardy so far, but it is not much known. Mountain rose is tender in its buds but withal does very well. All varieties of the peach tree should be headed low. Oldmixon, an excellent white variety, is objectionable on the same grounds as the Crawfords, yet does well where peaches generally do well. Golden Drop and Smock are likely to be too late so far north as Mason county. Snow's Orange is much the same as Barnard. Hill's Chili is a standard sort and very hardy. Near the lake the matter of the slope of the land is not of much importance, but further back a western slope is preferable. There are plenty of good orchards upon the brink of the lake at South Haven, but some have windbreaks and they are beneficial, especially against severe winds late in the season.

Mr. MORRILL warned the Mason county growers against yellows and urged them to have commissioners appointed in each township. Yellows, he said, killed a million of trees in Berrien county when they were bearing so full that they loaded three steamboats each day and sold for 75 cents to \$2.25 per basket. He recited provisions of the law, and assured the growers that new trees might safely be planted where diseased trees had been removed.

CURCULIO AND CUTWORMS.

Mr. GULLEY: Mr. STEARNS, by use of his lime and acid, only drives the curculio off from his own trees and on to those of neighboring plantations. I believe that were this practice generally engaged in, the curculio would stay right where they were.

Mr. REID said he had observed the efficiency of this remedy in Mr. STEARNS' orchards and believed that its general use would drive the curculio back to the forests, whence they came, or exterminate them.

Mr. GARFIELD agreed with Mr. GULLEY and thought the remedy one of very doubtful moral status.

Mr. MORRILL: We are greatly troubled, in the southern part of the state, by cutworms ascending peach trees and grapevines and eating off the buds or young shoots. I was never able to stop them until I used

bands of wool about the trunks. Many have used cotton batting, but it packs in the rain, giving the worms a sufficiently firm footing; but wool remains loose and they can not crawl over it. It is the same worm as the one that infests vegetable gardens and corn fields. Leaves of anything they will eat (such as dock or clover) poisoned by dipping into a solution of Paris green and laid about on the ground will kill them in large numbers. I have for several years tested the buckwheat cure and found it efficient. Sow the buckwheat in the orchard or vineyard and plow under when in bloom.

PEACHES.—THE BORER.

MR. SHELDON: Would each of the varieties of peach named be adapted to clay soil?

MR. GULLEY: Yes, on the whole, except that the last two would probably be too late when on clay loam. The borer is not now regarded as one of our serious enemies. If signs of the borer (dust or gum) are seen when the trees are being banked up to prevent water from settling about them and doing damage when frozen, dig him out with a knife or piece of wire; and do so in the spring when removing such banks. Such banking is a good practice for either young or old trees, though for young ones especially.

MR. C. A. SESSIONS of Mears: I have found much fewer borers where I had used ashes about the trees than where I had not.

MR. MORRILL: Rubbing the bark about the roots of the trees with hard soap in the spring is said to repel the moth.

MR. PEARSALL: Such banks or mounds are also valuable because they keep off mice.

CONCERNING APPLES.

A discussion arose about preferred varieties of apple. President LYON said the Cogswell is not much known here, but from reports from New York he believes it to be desirable as a good keeper of medium quality.

MR. ROBINSON: I have found Gravenstein a failure here.

MR. SCOTT: It is one of the best at Ann Arbor.

MR. LYON: It is an excellent culinary apple and satisfactory for dessert.

MR. McCLATCHIE: With me it is tolerably productive and of fine quality.

MR. LYON: Grimes' Golden is not profitable here because it is not a good bearer and its color is against it in the market. It is very excellent, however.

MR. GARFIELD spoke of the success of Prof. TAFT in use of "blue water" (eau celeste) in spray to prevent the scab in apples. This fungus has been rapidly gaining ground and has made very serious losses by making so much fruit scabby and misshapen. But by use of eau celeste, some good sorts, such as Snow and Early Harvest, may again be cultivated, and others, like the Spy, become more valuable. It was used in combination with Paris green spray and used three times. The result was that only twelve per cent. of the fruit was scabbed, while upon unsprayed trees all but twelve per cent. was so.

To a question as to keeping of apples for family use, Mr. SCOTT

replied: Keep the temperature as near freezing as possible and the fruit tightly barreled till spring except as wanted for use.

Mr. GARFIELD: A good fruit house may be made by building eight-inch walls filled with sawdust all around, using cheap boards if desired. I lately saw perfect Spies in such a house.

LATE PEARS AND THEIR KEEPING.

Mr. QUACKENBOSS: How can late pears be kept? How long can you keep Anjou?

Mr. SCOTT: Till January, although I usually market them in November.

Mr. ILGENFRITZ: Late pears should be put into tight boxes in a cold place and brought to warmth and light to ripen them. He commended the Vicar, Lawrence, and Winter Nelis. The latter is hard to get except by top-grafting. The Vicar is not very good except in some seasons when it is really fine.

Mr. SCOTT: I grow Bosc but little, but wish I had more of it. Its color is against it, but it is selling better as it becomes better known.

Mr. W. H. PAYNE of South Haven: I have kept apples and pears long and perfectly, packed tightly with perfectly dry maple leaves between each layer.

Mr. MORRILL: Keeping is wholly a question of packing and temperature. Pack only the fruit of first quality and do it thoroughly. In Benton Harbor, men are now rolling Baldwin apples out of their cellars at \$3.50 per barrel, which have been kept at about freezing point ever since they went in.

Mr. LYON: From \$10 to \$25 invested in a cold-house in which no ice need be used, will provide for the keeping of even perishable fruits several days, and apples indefinitely if put into the cold-house while cool.

Adjournment was made till 7:30 o'clock, P. M.

Evening Session.

After the reading of a report on exhibits, which only showed the presence of a few varieties of winter apples, WILLIAM WARNER, of Ludington, asked if any one had found little yellow flies underneath the plum leaves. Such insects had badly injured some of his trees.

Mr. SESSIONS: I have seen such but do not know of their doing any harm.

Mr. GULLEY: It is some sort of aphid and spraying will be effective against it.

Mr. SESSIONS: (In reply to a question.) There is no particular difference in plums on the whole, as to liability to disease. Lombard is worst of all, as to leaf-drop. Pond's Seedling is very hardy with us.

Mr. LYON: There are two Pond's Seedlings, one American and one English. The latter is the one cultivated in Oceana county.

Mr. GARFIELD: I have some trees of this variety, but they have proved to be unfruitful and unhealthy.

Mr. SCOTT: Perhaps, like all things American they need protection.

Mr. LYON: Japanese plums are promising, a few sorts at least in some localities.

Mr. SESSIONS: All such fruited in Oceana county have been unsatisfactory and are discarded. To Mr. McCLATCHIE's inquiry as to rot of the plum, Mr. SESSIONS replied that he could suggest no remedy except spraying.

Mr. LYON: It is thought that this disease is started by water retained between the fruits or the fruits and leaves, causing rupture of the fruit and consequent rotting, the spores being rapidly disseminated.

Mr. GARFIELD: How long is the plum season here?

Mr. McCLATCHIE: The first ripen about the middle of August, Duane and Bradshaw at about the same time, and then on till the middle of October.

Mr. MARSH: I am astonished at the plums here. Can their production long continue upon such soil?

Mr. SESSIONS: Some of our finest plum orchards are upon light soil, but they are the exception.

Mr. LYON: I have seen fine plum orchards upon the most porous of soil.

Mr. GARFIELD: My plum stocks have not grown, though the scions have grown to good size; and some trees have broken off at the juncture.

Mr. ILGENFRITZ: Several stocks are used in growing plum trees in the nursery. in this case the scion is too thrifty for the stock. A possible remedy would be the heaping up of earth to the stock and the getting of plum roots, but this I have never tried.

Mr. WARNER: I have slit the bark and wood across the juncture and so gotten increased growth.

Mr. McCLATCHIE: The plum will root wherever it touches the earth. I use peach stocks altogether. The plum roots from the scion would not affect the quality of the fruit.

A LITTLE GARDEN WELL TILLED.

This was a subject chosen by Mr. GARFIELD for a paper, which was half paper half speech: but he said substantially as follows:

"A little garden well tilled," is one of the requisites of an ideal condition of rural happiness. It is a rarity, however, and this is my excuse for speaking today. The things I shall tell you will not be remarkable for their originality, but rather for the truth about them, that they are among those things which we all know but few of us practice. I know of peach growers who are noted for their success in growing this fruit, who have not a berry plant growing upon their premises. I know of premium berry-growers whose vegetables are limited to potatoes and cabbages, and it is common among my acquaintances to find men who are counted as successful farmers who consider it more profitable to buy their "garden sauce" than to grow it. I would like all these successful specialists to exchange places with their wives for a little time and understand upon what basis success in good housekeeping stands. I would like them to feel more keenly the torture of the ancient Israelites who were compelled to make bricks without straw. I knew that the success of our specialists in horticulture depends upon the completeness with which they adhere to this maxim "THIS ONE THING I DO." But I insist that every man to get the highest enjoyment out of this life, must have his hours of recreation;

and blessed is that girl who becomes housekeeper for the man who secures a large measure of his recreative happiness in developing a good garden for the household.

A good garden means a good living, if accompanied by reasonable ability in the art of cookery. It can be secured at light expense but requires the exhibition of some gumption, and the highest measure of success will come only to those who take delight in securing the maximum yield of produce from a given area of soil.

In giving the counsel that occurs to me as desirable to secure a good garden in connection with a rural home, I shall chain a series of questions to an enunciation of principles.

(a.) The garden must be not far removed from the house.

(b.) The soil, no matter what its character, must be in good heart.

(c.) To reduce the labor to a minimum the garden area should be a long rectangle.

(d.) One person connected with the household should be charged especially with the responsibility of the garden.

(e.) The aim should be the securing of a variety of vegetables and small fruits throughout as long a season as possible.

1. What shall be the preparation of the soil? If the soil is in good heart, capable of growing a large crop of wheat or corn, add well-rotted manure, ashes, the scrapings of the hen-house, a load of sweepings from the blacksmith shop, thus placing within reach of your growing plants a great quantity of available plant food. Thoroughly pulverize the soil to the depth of not less than eight inches. Cultivate and harrow until it is in the finest condition of tilth, and if this can be done at intervals in the spring, before planting time, the scourge of cutworms may be reduced to a minimum.

2. What is needed for a good variety, and in what quantity, for a family of half a dozen? Twenty plants of asparagus will furnish an abundance through the season; six plants of pie plant are sufficient; ten hills of cucumbers; 100 feet of parsnips; 100 feet of vegetable oysters; 200 feet of peas, in variety; 50 feet of cabbages, to include early and late sorts; 50 feet of beets; 25 feet of lettuce; 100 feet of turnips, early and late; 75 feet of radishes for the season; 10 feet of parsley; 100 feet of onion sets and 50 feet seed onions; 25 feet of carrots; 200 feet of bush beans; 200 feet of Lima beans; 300 feet of corn for succession through the season; 5 hills of summer squashes; 20 plants of tomatoes; 20 hills each of water-melons and musk-melons; 10 hills of winter squashes; 100 feet of early potatoes.

This list might include many other things valuable to have in a garden, but in it I have placed that which will cover the year with a good variety of vegetables, except the winter supply of potatoes; and the garden will be about a quarter of an acre in extent.

3. What arrangements should be observed in planting? My own plan embraces the following points:

(a.) Although the rows should be long, it is better to plant peas, beans, and corn in blocks. This can be done by having other vegetables to complete the rows. For instance, last year I had a block of early corn across four rows; then a block of medium corn, further on, occupying the same rows; and two blocks of later kinds finishing the four rows, thus giving me 400 feet of corn, as my rows were 100 feet long. In the same way I managed to have six rows given up to blocks of bush beans, peas, and Lima beans.

(b.) A succession of crops may be grown, and if the soil is in proper condition it should be cropped to the fullest extent. My radishes are mostly grown with other things, the seeds of which germinate more slowly—as with onions and vegetable oysters. The early potatoes may be followed by celery, turnips, or late cabbages; and the peas may be followed by cabbages or tomatoes. My cabbage plants for late planting are usually grown in rows of other things, and lettuce is sown on any vacant spot during the whole season.

(c.) Crops that remain over winter in the ground, as salsify and parsnip, should be planted next to the permanent vegetables, like asparagus, and at one side of the garden.

(d.) I arrange as far as practicable to have the rows so planned that in succeeding years I can easily make a change of sorts upon the same ground.

4. What culture should be given? The one-horse cultivator should go through as often as once a week during the weed-growing season, and it is well to observe the fact that weeds are killed the easiest and most effectually destroyed just before they can be seen above the surface. To supplement the cultivation I use a garden rake more generally than a hoe, and have found that to young plants a raking of the surface will give an impetus in growth quite wonderful to behold.

5. Any special management, to be recommended for the different vegetables? For this small area of potatoes I would use good tubers, cut once in two lengthwise, planting one piece in the hill; should furrow the row, plant my seed, cover with two inches of earth, and then fill the furrow to the level with good stable manure. I should not pole my Lima beans, but keep the runners well pinched back. I should tie my tomatoes to stakes or frames so as to hold them well up from the ground. I should aid in the fertilization of my squashes and melons, using a little camel's-hair brush for the purpose. I should plant my onion sets in the fall if possible and cover with a mulch. I should put my peas in, for the first crop, as early as possible in the spring, and plant three or four inches in depth.

How about insects? My first trial is with cut-worms, and these I manage to circumvent, first by early and continuous cultivation; second by trapping with poisoned clover, and third by gathering in a harvest of them with thumb and finger. Potato beetles cause me little trouble. I take a garden sprinkler and go over the rows very rapidly with poisoned water. Cucumber beetles I dust with sulphur or white hellebore diluted with sifted coal ashes. Black squash bugs and tomato worms are gathered by hand.

In addition to vegetables, the kitchen garden may very profitably contain currants, strawberries, gooseberries, raspberries, and blackberries. A 100 foot row of each of these fruits will furnish a large amount of delicious fruit at a very light expense. These should be placed along one side with asparagus and pie plant.

The amount of living to be secured from a half acre of land thoroughly tilled is marvelous. I doubt if any piece of ground upon a farm if utilized to the fullest extent under the most approved system of husbandry can be made so profitable to the owner as the garden area. It is, however, the one piece of ground upon many farms the most neglected. It takes its turn of cultivation last, and is hoed nights and mornings and holidays, if hoed at all.

PLAN FOR A GARDEN.

Early potatoes.			
Very early corn—3 rows.	Early corn.	Medium corn.	Late corn.
Winter squash—1 row.			
Musk-melons—one row.			
Water-melons—1 row.			
Lima beans—2 rows.			
Cucumbers and summer squash—1 row.			
Bush beans followed by late turnips—2 rows.			
Very early peas— 2 rows.	Early peas. Followed	Peas. by tomatoes planted be	Peas. tween rows.
Seed onions with radishes—½ row.		Early turnips—½ row.	
Onion sets—1 row; followed by late cabbage.			
Lettuce—¼ row.	Carrots—¼ row.	Beets—½ row.	
Salsify—1 row.			
Parsnips—1 row.			
Asparagus.		Pie plant.	

In estimating the profits of a garden, we should reckon on the healthfulness of a variety of vegetable foods supplemented by fruits in season. To be sure, we can live upon bread and potatoes and pork and be reasonably happy, but the measure of satisfaction to be derived from the products of a "little garden well tilled," will reach a long way ahead of this regimen; and no man who intends to live upon a farm should be married to the woman of his choice, by the officiating clergyman, until he has answered affirmatively, in a good clear voice, the question: Will you maintain "a little garden well tilled," for the use of your home? for this is the delightful accompaniment of "a little wife well skilled."

Upon conclusion of Mr. GARFIELD's remarks the meeting made final adjournment and the pomologists were escorted to the Elliott house and tendered a banquet by the Ludington Business Men's association, whose president, Mr. C. G. WING, did the honors as toastmaster. He was highly effective therein, both in his presentation of the general subject of horticulture and the importance of the work of the State society, and in his apt presentation of the toasts and his piquant or earnestly complimentary personal allusions. But aside from this, and President McCLATCHIE's response to the sentiment, "The Mason County Horticultural society," the visitors were required to do the talking. President LYON was received with hearty applause and responded to "Michigan horticulture." The others, in order, were "Lake Michigan, a cherishing mother," R. MORRILL; "The apple is king," E. H. SCOTT; "Let us have peas," W. H. PAYNE; "Our northern lake shore, the paradise of the pomologist," C. A. SESSIONS; "Politics and pomology," E. C. REID; "The Agricultural college," A. G. GULLEY; "Horticulturists have nothing to hide," S. M. PEARSALL.

It has been a long time since the society held a more enjoyable meeting, in a social sense, or one of more value to the local attendants.

TWENTIETH ANNUAL MEETING,

HELD IN KALAMAZOO, DECEMBER 2, 3, AND 4, 1890.

For the twentieth time the Michigan State Horticultural society has met for transaction of its annual business and preparation for the work of a new year. This time the assembly was in Kalamazoo and the time Dec. 2 to 4, and in all respects save that of local attendance the meeting was a complete success. The programme had wide range and most of the papers read were of great practical value.

PRESIDENT'S ANNUAL MESSAGE.

President LYON called the first session to order Tuesday afternoon, Dec. 2, and read his annual message, which is here appended:

Fellow Members of the Michigan State Horticultural Society:

As in the course of events nature has ordered that our earth and its attendant worlds shall be annually brought back to its original position, to re-traverse the cycle of the months, so, in the case of our society, the the course of events has again brought us to a stage appropriately dedicated to a retrospect of the operations of the year now past, and the consideration of the important problem, how we may gather wisdom from its lessons, and thereby secure increased effectiveness in the work of the coming year.

In accordance with the trite and homely adage that "charity begins at home," I am compelled to again refer to the circumstance that a very large proportion of our state, and especially its newer portions, is, to us, unoccupied territory; while its inhabitants, taken as a whole, seem but slightly conscious of the horticultural possibilities of their regions.

That an appropriation by the legislature, to enable the society to do a work in this field, otherwise impossible, would prove a profitable investment, even pecuniarily considered, can scarcely be doubted, in the light of results of similar legislation in other states possessing far less horticultural capacity than ours.

In lack of this, the society has heretofore proposed to distribute a portion of its annual volumes in such localities. Owing to various difficulties, little has heretofore been done in this direction; but it is understood that our secretary has recently inaugurated a movement of this kind, as he may be expected to explain in his annual report.

We suggest that, in the absence of local horticultural organizations, granges and other similar organizations, consenting to devote a portion of

their efforts to horticulture, be placed upon a basis equivalent to that of local societies, so far as the distribution of our transactions may be concerned; also that county and other local agricultural societies be, in some manner, enabled and encouraged to offer them, at their fairs, as premiums upon horticultural exhibits.

The society has heretofore proffered exchange of volumes to kindred organizations in other states; but the practice seems to a considerable extent to have fallen into disuse. Believing the practice to be a desirable one in many respects, I have recently prepared and sent out a circular, inviting a continuance or a resumption of such practice. This action is quite too recent to have secured responses generally, but those so far received have been favorable.

With the limited salary allowed our secretary, he is expected to devote only a portion of his time to the society's matters. Doubtless for this reason, at least in part, is due the circumstance of the very late appearance of the volume of the transactions for 1889. The previous volumes have usually been issued and distributed at a comparatively much earlier date; and we suggest that, whatever may prove to have been the cause of the delay, measures be taken to insure their prompt issue in the future. The occasion of such delay may be expected to appear from the secretary's report.

Upon the organization of the Detroit International Exposition, this society was invited to frame the horticultural portion of its premium list, and to assume entire charge of the collection, arranging and conducting of such exhibit; which was done in a manner very satisfactory to both parties concerned as well as apparently to the public. A similar combination occurred at the exposition of this year; but the date fixed for the fair proved quite too early for any save the very early fruits, leaving the staple fruits of the state practically shut out from any but local exhibitions, and precluding to a great extent the important educational features of such exhibit, out of which, in a good degree, have grown the high reputation of our state for the quality and correctness of its exhibitions.

It would seem that neither the society nor the state can afford to abandon the vantage ground it has so long held, as, in some sense, a monitor in pomology; and, Barnum like, assume the rôle of showman, as was, in large measure, the case with the horticultural display of 1890, at the Detroit Exposition, beautiful and extensive as it really was.

In view of the circumstances stated I recommend that an expert committee be appointed at this meeting, charged with the duty of carefully considering this whole subject, and devising means to remedy the difficulties growing out of it, and instructed to report at the next meeting of the society.

The occurrence of the coming Columbian Exposition at Chicago, almost at our doors, with the recognized standing of Michigan as a fruitgrowing state, constitute weighty reasons why our society should move earnestly, and at once, in the matter. There are very many important particulars to develop and to properly prepare for which imperatively requires that preparations be commenced with the opening of next spring; and this requires that plans be matured and arrangements effected during the leisure of the coming winter.

It will doubtless be recognized as a necessity that a liberal appropriation for the occasion be made by the incoming legislature. To insure that horticulture shall receive due consideration in such enactments, an

efficient legislative committee, to present its claims and set forth its needs, may fairly be deemed indispensable to prevent its being dwarfed and crowded aside as a merely incidental matter. Nothing short of a distinct commission, with sufficient means at their disposal, will be found adequate to the occasion.

It may doubtless be reasonably anticipated that the state board of agriculture, including the Agricultural college and the experiment station, will coöperate with the society in these matters.

As one of its closing enactments, the last national congress elevated the late commissionership of agriculture to the dignity of a secretaryship—constituting its head one of the confidential advisers of the President. During his administrations as commissioner, Mr. Coleman, among other things, organized and launched a division of pomology, placing H. E. Van Deman, formerly of Kansas, at its head. During the first year or two the new division was hampered by the very limited appropriation provided for the doing of its work; but the allowance for the present year, though by no means adequate for the much there is to be done, is yet considerably larger than that of the previous years, and thereupon the division, among other things, has addressed itself to the effort to systematize and develop the science as well as the practice of pomology. One of the most important steps in this direction is felt to be the bringing of the division into more intimate relationship with those engaged in fruit culture, in its various branches, throughout the country.

Soon after the increased appropriation had become a certainty, I was tendered an appointment as special agent of the division of pomology, charged with the duty of attempting to inaugurate an effective system of coöperation, more especially in the west and northwest, between the division and the various horticultural organizations of the country, including any and all such granges and agricultural societies as may include horticulture or pomology in the sphere of their operations.

Previously to the tender of such appointment, however, I had entered into arrangements with the state board of agriculture to conduct a branch of the state Hatch experiment station, under their charge, at South Haven, the same to be devoted mainly to the testing of new fruits; my own previously-planted ten acres of land, together with five acres adjacent, contributed by the citizens of South Haven, being occupied for this purpose. Owing to such previous engagement, I could only undertake to devote a portion of my time to the work of the division; and, after consultation with those representing the board of agriculture, with their approval, I accepted the proposed special agency, undertaking to devote a portion of my time to its duties.

This agency presents an altogether new field of operations, and the full development of the plan of operations must necessarily await the result of conferences with the various organizations concerned.

It is at present proposed that I visit various state and other pomological and horticultural organizations; and, from conferences with them, and a consequently more perfect acquaintance with their needs, as well as their preferences, deduce and perfect a general plan of operations.

This meeting affords occasion for the first step in the proposed process, to be followed by visits to societies in Indiana, Illinois, and possibly Kentucky, within the coming two weeks, and also others at later dates.

The division, on its own part, proposes to distribute its bulletins and other publications, either directly to the societies, or to persons whose

addresses shall be supplied for the purpose; in addition to which, it will be able to supply more or less of the publications of other and kindred divisions, among which are those of mycology, botany, forestry, entomology and perhaps others, including the general report of the head of the department.

Specimens of new or rare fruits and plants, as well as of those to be sent for identification, are invited; for which, on application, mailing boxes and postage will be supplied; or, if preferred, application may be made to me instead, at my headquarters at South Haven, Michigan.

At present the division and, in fact, the entire department, is in narrow quarters; in consequence of which their operations are more or less hampered or embarrassed; a state of affairs which, it is hoped, may be remedied in the not remote future. It is also hoped that the division may soon be authorized and, by appropriations for the purpose, enabled to collect and distribute for trial, seeds, plants, and cuttings of rare, valuable, or new and promising fruits, and other horticultural products; and that it may be supplied with facilities, which it yet lacks, for the propagation of such for dissemination.

On the part of the societies it is proposed that they furnish lists of their officers and members, one or both, with their postoffice addresses, the same to be corrected as often as needful.

Also that they maintain a standing committee or committees of persons qualified to respond, as fully and correctly as practicable, to such circulars or other communications, calling for information, as the division may from time to time send forth.

It may quite possibly be found desirable that such societies shall supply the division with the addresses of such local horticultural societies, agricultural societies, granges, and other local organizations, as may become affiliated with them in matters pertaining to pomology, or general or special horticulture; though just what action shall be found preferable in this direction, must depend upon future developments.

There are probably other means by which the society and the division may be able to mutually aid each other in the important work of developing, systematizing, and generally advancing and building up the important and growing horticultural interests of our common country. Just where, how, and to what extent these operations shall be carried, it is a leading purpose of the contemplated system of visits to develop and determine.

Probably the most serious embarrassment with which this society has to contend, is a lack of the memberships from which its chief source of means for the defraying of its unavoidable expenses must necessarily be mainly derived. The fact that while so many persons readily avail themselves of the facilities afforded by our periodical gatherings, as well as of the annual volumes published at a large expense to the society, and this in a state so extensively devoted to this class of interests, is but a sad commentary upon the public spirit, not to say upon the ordinary sense of right and propriety, of its horticulturists as a body.

It is hoped that the many and decided advantages to grow out of the contemplated co-operation, with the National division, as already proposed, may be so employed by the society as to largely add to its list of active, paying members, and to its means of general effectiveness.

Yet another source whence an increased membership may, perchance, be educated, would seem to lie in a possible arrangement with the authorities in

charge of the state experiment station, and even with the State Agricultural College also, by means of which their publications also may become available to those becoming members of the society.

ANNUAL REPORT OF SECRETARY.

It is cause for thankfulness and congratulation to Michigan fruit-growers, that at the close of the most disastrous year they have ever experienced, they find no diminution of either faith or interest in their calling. No one supposed that the enormous business of fruitgrowing in Michigan rested upon such slight foundation that one or two seasons of minimum crops or total failure of some kinds of fruit could overturn it; still it is a comfort amid misfortune to have this fact demonstrated.

While the failure of all the large fruits may correctly be said to have been general, there were many local exceptions as to the apple crop and a few as to the peach. In the former case the favorable yields were by individual orchards mainly, but the peach yielded good crops in the southeastern parts of the state and in Mason county, while Oceana county growers had a partial but highly remunerative crop. The plum crop of Oceana was less than half that of last year, but of fine quality and sold at high prices. Pears were scarce everywhere, and grapes everywhere abundant, a complete reversal of the conditions of 1889. The berry crop was nowhere a full one and the season everywhere was light.

It was a rich harvest, however, for the evaporator men. While they paid comparatively high prices for stock which in ordinary years would be touched by nothing but the hogs, their sales have been at unprecedented rates. This paves the way for a good season in 1891, whatever the extent of the crop, for, long before apples come again, not a pound of evaporated fruit will remain in the country.

Michigan was never before so overrun by apple buyers, nor the secretary of this society so importuned, by letter and in person, for information as to where apples could be obtained. Yet this part of his work is likely to increase year by year, as the extent and the labors of this society become more and more known. The secretary should in the future secure, from time to time through the season, reports from members or societies throughout the state, so as to have detailed knowledge of crop conditions and be prepared to give reliable information to all such inquirers. Such as he possessed this year was the means of securing many more competitors for purchase of the fresh fruit and the location within the state of many evaporators or buyers of evaporator stock. In this line, especially in seasons of a scant general supply, the society can render to the growers a service of great and direct financial value.

But this season of scarcity and failure does not seem to have appreciably decreased the tendency to set new fruit plantations, unless it be as to those of the peach in the southwestern part of the state, where two successive winter-killings of the fruit buds may have such an effect. But plantings of the plum, pear, grape, and especially the apple, are unchecked.

Such a season as the last or its predecessor is not a favorable time for pushing schemes for cheaper transportation, because, with prevailing high prices, the sum paid for carriage cuts a deal less figure than when it becomes a large fraction of the margin of profit or equals or even exceeds it. Yet the growers of Mason and Oceana counties got large concessions from boat and railway companies, and some gain in this line was made at

Ann Arbor. It is not to the credit of the fruitgrowers of the west and southwest parts of the state, that lower rates are likely to come by rivalry of railway lines than through the growers' combined action.

While there was everywhere prevalent, even in the forests, a blighted and unhealthy condition of foliage, last season, there was not an unusual amount of the blight of pear and quince, and there has been advance in knowledge of preventive and curative methods with this disease as well as with the various fungi which kills the leaves or scabs, cracks, or rots the fruit of the apple, peach, plum, and pear. In the large peach district of the southwest a considerable increase of yellows was noticed, but this was finally considered to be a two-years increase, because many of the infected trees doubtless were so in 1889 but did not show it promptly, not having been in fruit. I fear that the disease will be much more manifest if the trees generally bear in 1891, for it is undeniable that this second failure of the crop has caused neglect this year in many orchards.

The present yellows law seems to be sufficient in its terms and provisions. Whatever faults it has are chiefly those common to other statutes—it does not enforce itself. Nor is it, in all sections, enforced as one would suppose the self-interest and common-sense of fruitgrowers would cause it to be. In this connection I would commend to the attention of the society and the committee on legislation, the proposal, to be made by letter from Mr. A. J. KNESELY of Benton Harbor, at this meeting, to secure an act, similar to the yellows law, for inspection of plum orchards for suppression of black-knot. This disease is quite as contagious to the plum, and quite as fatal, as is yellows to the peach.

The annual fair of the society was again held with the Detroit Exposition, and was again a success, despite the too early date (Aug. 26 to Sept. 7), and the failure of the fruit crop. Yet we had quite 1,000 plates of fruit; what was lacking in this respect being well supplied, so far as either quantity or appearance went, by the large show of vegetables and the remarkably fine floral display. I am unable at this time to say what is likely to be our arrangements for an exhibition in 1891.

The improved financial condition of the society over that of one year ago is highly gratifying, the balance of cash on hand now, after payment of all expenses up to the opening of this meeting, being \$233.65, against a balance of \$42.96 at a similar period one year ago.

I would heartily commend the plan, proposed by our president, for coöperation of this society with the national department of agriculture, in all respects stated, as well as its corollary, closer relations between this society and the district and county societies of the state. The horticulturists of Michigan were never so well organized for mutual support and advantage as under the auxiliary system of membership established some years ago by ex-Secretary Garfield. I believe that its re-establishment, in connection with these new relations to the department of agriculture, may be easily accomplished. That it would be beneficial to all concerned can not be questioned.

During the year fifteen orders were drawn upon the treasury, aggregating \$194.31. These expenditures may be classified thus:

President's office	\$4 00
Volume of 1889	18 00
Exchanges	6 85
Librarian's salary	37 50

Delegates	78 03
Printing	18 75
Postage, telegrams, telephone, express charges.....	31 18

About half of the sum paid as expenses of delegates was for those sent to the meeting in Chicago for organization of horticulturists for work at the World's Fair and their journey to Detroit for conference with President Palmer in connection with the other officials of this society, then in attendance upon our fair. The rest is for delegates sent to Windsor, in December last, to the meeting of the Ontario Horticultural Society.

EDWY C. REID, *Secretary*.

ANNUAL STATEMENT OF LIBRARIAN.

To the Executive Board and Members of the State Horticultural Society:

GENTLEMEN—I have the honor to submit herewith my annual report, as librarian of the State Horticultural Society for the year ending December 1, 1890. The following tabulated exhibit shows the number of our reports which have been received and distributed during the past year.

	1872	1873	1874	1875	1876	1877	1878	1879	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889
No. of books in library Dec. 1, 1889.....	23	1	2	64	33	0	1	470	59	753	761	1,925	2,678	1,729	941	0	5,314	-----
No. of books received during 1890.....	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	6,000
No. of books distributed during the year.....	4	-----	-----	15	4	-----	-----	30	31	32	35	34	33	67	65	-----	3,951	-----
No. of books in library Dec. 1, 1890.....	19	1	2	49	29	0	1	440	28	721	726	1,891	2,645	1,662	876	0	1,637	6,000

The following books have been received through exchanges during the year:

HORTICULTURAL REPORTS.

Illinois State Horticultural Society, 1889.
 New Jersey State Horticultural Society, 1889.
 Wisconsin State Horticultural Society, 1889.
 Maine State Horticultural Society, 1889.
 Missouri State Horticultural Reports, 1889.
 Minnesota State Horticultural Society, 1889.

AGRICULTURAL REPORTS.

Connecticut State Board of Agriculture, 1889.

MISCELLANEOUS.

Kansas Historical Collections, 1886-1890.
 Kansas State Crop Reports, 1890.

Very Respectfully,
 T. H. FORSTER, *Librarian*.

The treasurer's report showed the same balance as the secretary's and gave full information concerning investment of the life membership fund. These reports were referred to a committee for investigation and report.

OBJECTIONABLE WORLD'S FAIR SCHEDULES.

Mr. C. W. GARFIELD and Prof. L. R. TAFT had been appointed by the executive board a committee to present to other societies a protest against the schedules of "Department B.—Viticulture, Horticulture, Floriculture" of the World's Fair, and the matter was brought up for consideration by the society. Mr. GARFIELD explained that it is proposed to divide this department into "groups," thus:

Viticulture—fourteen classes.
Horticulture—four classes, vegetables only.
Floriculture—twelve classes.
Arboriculture—three classes.
Pomology—four classes.
Appliances—six classes.

The special faultiness of this was shown to be the great prominence and diversification of the grape-culture groups which included five classes of wine and brandy; the subordination of pomology; the restriction of horticulture to kitchen gardening, and misuse of terms commonly accepted and understood. The committee embodied its views in the following circular which, with a copy of "Department B" in full, had been sent to other state societies:

KALAMAZOO, MICH., Dec. 2, 1890.

Enclosed with this you will receive a copy of the proposed schedule in the Horticultural Department of the World's Columbian Fair.

We understand it has been prepared by Prof. Blake of Yale college, and is likely to receive the indorsement of the National Commission. To us it seems so faulty that we are thoroughly awakened to the danger of its adoption, and we hasten to acquaint our sister societies with the present status of affairs, and ask them at once, in their present sessions, to select some one who can, upon notification, be an ambassador to Chicago, to urge upon the management a change to comport with the acknowledged reasonable classification accepted by the horticulturists of the world.

We indicate below, without amplification, something of our own views:

DEPARTMENT B.—HORTICULTURE.

Group 21—Pomology.
Group 22—Floriculture.
Group 23—Truck and kitchen gardening.
Group 24—Arboriculture.
Group 25—Horticultural appliances.
Group 26—Miscellaneous.

Please act upon this, and we will try and notify you when we can meet in Chicago and accomplish something, if possible, toward a revision of the present unfortunate classification.

Address communications or inquiries to Prof. L. R. Taft, Agricultural College P. O., Michigan.

Yours earnestly,
MICHIGAN HORTICULTURAL SOCIETY.

S. H. COMINGS of St. Joseph: Will this authority, in preparing the grain schedules for the World's Fair, give to the manufacture of whisky from rye and corn the same prominence it has given wines in horticulture?

This bit of humor gave relief from the prevailing stress of indignation but it cost Mr. COMINGS many a good-natured jibe during the rest of the meeting.

Replying to a question as to how the Michigan exhibit at the Centennial was provided, said

Mr. LYON: When the legislative appropriation for the Centennial was made, horticulture received nothing whatever. But some person or persons on the board appointed by Gov. BAGLEY supplied from private sources funds for the exhibit of our horticulture, which was so highly successful that the New York exhibit was not unpacked, its custodians refusing to permit the contrast.

GOOD WORK OF THE DEPARTMENT OF AGRICULTURE.

Prof. COOK: The department of agriculture has never done so much as it is doing now in the way of practical, valuable work, and this and all other societies can not do better than to associate very closely with it. This society is wise in taking such early action.

SHOULD PREPARE AT ONCE FOR THE WORLD'S FAIR.

Mr. R. MORRILL of Benton Harbor: It would be well to take some action to secure state aid for the horticultural exhibit.

Mr. J. N. STEARNS of Kalamazoo: I have for years contended that Michigan is best of all the states for horticulture, and now feel that we should make this fact and the advantages of an early and full exhibit well known to the legislature. Our horticulture should be very fully represented.

Mr. MORRILL: I did not mean that we should act only through the committee to be here appointed, but local influence should be brought to bear upon the members before they go. Unless we all take hold of this work, too (all parts of the state), people who go to the Fair will receive an impression that Oceana county is all there is of the Michigan fruit region, for Mr. SESSIONS will see that no effort is lacking to that end—just as at Detroit he covered all the tables and swept away all the plum and peach premiums and secured to Oceana county all the horticultural advertising of the past two years.

Mr. GARFIELD: It must be largely an exhibit of methods. Not only, for instance, must Kalamazoo celery be shown, but methods by which it is grown; not only must there be a show of red apples, but the ways and means of their production.

The chair announced Messrs. S. H. COMINGS, A. J. COOK, and W. A. TAYLOR a committee on resolutions, and a recess was taken till evening.

Tuesday Evening's Session.

The vice-president, Mr. GARFIELD, occupied the chair, President LYON having gone to Indianapolis to attend a meeting of the Indiana State society, in connection with his agricultural department work. Mr.

GARFIELD said that as Michigan has no forestry association it is proper that work in this line shall be done by the horticultural society; and hence, when asked to furnish an address for this evening, he had prepared instead this

PROGRAM OF FORESTRY.

Gov. LUCE once asked him, speaking of forestry matters, "Why don't your society come to Coldwater and talk to us about these questions?" "Why," I replied, "you don't want us there. A few years ago we were there, and, some one having advocated the use of windbreaks and leaving of timber lots, the Branch county farmers present unanimously condemned both practices and favored cutting the last tree." "Well," answered Mr. LUCE, "we don't feel that way now."

The tendency today is toward intensive culture and there is a feeling that we are stealing when we take more from the land than we return. More can be gotten from twenty-five acres now, and fifteen left for the woodland, than forty under the old system. Mr. GARFIELD introduced Mr. A. C. GLIDDEN of Paw Paw, as the first speaker, to treat of

"THE WOODLANDS OF SOUTHERN MICHIGAN."

Mr. GLIDDEN: I look about southern Michigan for woodlands, but they are not here. They have been swept away to give place to meadows and fields of wheat and corn. But ideas have changed as to this. I do not know that there is any more demand for timber now than 25 years ago; but there is not so much talk about it or so much fear of its destruction—or, if there is, it is not expressed. Young timber is growing up in many places and there are yet some of the original trees, and all is in great demand. Like other crops, timber should be cut when matured. No consideration of sentiment should allow trees in wood lots to ripen and decay. Matured trees should be cut, too, to give room to young growth. But such young growth is not given the care it should have. I have a neighbor who has a lot of fine young oaks and some old ones. Asked what he meant to do with the latter, he replied, "Well, if it was for profit, I know very well what I should do. But unless a man has need of such profit he should not be allowed to cut such trees." Not so. He should cut the old growth and care for the young. I did so with my own timber, cutting the old trees close to the ground and giving the young ones the best care I can. I gain by such care, for they will grow very rapidly. Ten acres will grow all the timber the farm needs. There is not likely to be an increased demand for timber, because of changes in processes of manufacture, and the metal, aluminum, made from the clay which abounds everywhere, is likely to largely take its place. But there is something more than dollars in groves. I yield to no man in veneration for fine growing trees. Planted trees are not likely to be successful for timber. Timber trees must start naturally and be trimmed and the cut branches left with the leaves on the ground as a mulch.

Mr. GEORGE TAYLOR of Kalamazoo: I was reared in Scotland where forestry is scientifically conducted. The great secret of success with planted trees is their proper thinning. One large tract I knew of was planted with pines and hardwood trees, the former being removed when they had accomplished the purpose of making the others "draw up"—start in a tall

form without side branches. Many tracts I know of are suffering from want of thinning which with it would be making good timber.

Mr. GARFIELD: I agree with Mr. GLIDDEN that we must not forget the practical when dealing with the sentimental. Because I would not permit the cutting of the elm in my yard, should I also refuse to cut the mature elm in the forest? But tree murder is the crime of America against the universe. I have a thorough appreciation of him who sees sentiment in the groves and forests; who sees

"Sermons in trees, books in the running brooks,
And good in everything."

If we can in any way stop this killing of trees needlessly, we should do it. One place to do this is in the school room. Teach the children, and through them our children's children, to love and reverence them. I know that Miss CAROLINE J. BARTLETT will add to these sentiments, and so I will not enlarge upon them, but introduce her. [Miss BARTLETT is pastor of the Unitarian church in Kalamazoo, and impressed her hearers as a lady of broad and cultivated mind, able in high degree as a thinker and orator, yet losing nothing of the charm and nobility of womanliness. She read the subjoined essay, which was received with sincere applause both for its beautiful thoughts and its admirable literary style.]

THE HUMANIZING INFLUENCE OF SYLVAN BEAUTY.

Mr. Chairman, Ladies and Gentlemen:

Kindly permit me to begin my paper by relating a few incidents pointing to its conclusions.

A year ago last summer, on my way home from a tour of the White mountains, I passed, one glorious afternoon, northward along the eastern edge of Lake Champlain. As our train neared St Alban's bay, the sun was just setting behind the Adirondack hills, and the broad lake was flooded with a marvelous beauty. As I sat feasting my eyes upon the scene, I noticed that the only other occupant of the car, a lady, who sat some distance in front of me and on the other side, was glancing at intervals, with little interest, upon the comparatively tame view from the eastern window, apparently unconconscious that there was anything of greater beauty within the range of vision. The missionary spirit was roused in me, and going to her I said: "I beg pardon, madam, but do you know you are missing a superb sunset?" Her reply, polite enough in form, was nevertheless something of a shock. With the air of satisfactorily accounting for her indifference she answered: "Thank you, but—I live here."

A friend of mine who visited New Hampshire and expatiated upon the fascinating beauty of her forest-clad, rock-bound hills, was thus answered by an old farmer of that region: "If you had to git your livin' off'n these hills, I guess you wouldn't be quite so 'thusiastic.'"

While amid the magnificent primeval forests of Puget sound, this summer, it made my heart ache to see the slaughter, by axe and fire, of those giant cedars and firs which, lacking a present market, are by the owners counted naught but cumberers of the earth that must be cleared and portioned with hasteful, wasteful thrift, into parcels and lots, eager to be embraced in the ever widening wave of the "city's limits."

My use of these incidents is to show that familiarity, as that of the

lady with the Champlain sunsets; or difficulties, as those presented by the New Hampshire stones and stumps to the farmer; or speculative greed, as that which possesses tree murderers of many sections of our country, have power to blind the eyes to the beauty and deaden the feelings to the uses of beauty in natural scenery.

And yet this love and appreciation of beauty seems to be inherent in the race. The longing of the Dakota settler for a sight of the trees that waved their friendly boughs about his earlier home; the growing demand of city bred men for homes in the suburbs, where, after the day's work is done, they may flee to a refuge from the barren life of a great metropolis; the more and more prevailing fashion of yearly outings by lake or seaside or amid the mountains; the longing love of the westerner by adoption for the old New England home—

"I love thy rocks and rills,
Thy woods and templed hills;"

all these seem to show that deprivation, memory, and the perspective which time and distance lend, open the eyes and the hearts to the charm, and perhaps the lessons which grow, too often, stale with use and difficulty. Yet there is room for discussion here. How much is a love of nature for her own sake, and now much comes from association with other things beloved—home, native land, or some beloved person? Old John Byrom's pastoral pleases me much. "Colin," temporarily bereft of his "Phœbe," thus makes moan:

"When walking with Phœbe what sights I have seen;
How fair was the flower, how fresh was the green!
What a lovely appearance the trees and the shade,
The cornfields and hedges and everything made!
But now she has left me, tho' all are still here,
They none of them now so delightful appear;
'Twas naught but the magic, I find, of her eyes
Made so many beautiful prospects arise."

It would appear that "the eye sees what it brings." It depends on us, our quality, our mood, the purpose of our association with nature, what front she shall present to us.

"To him who, in the LOVE of nature,
Holds communion with her visible forms,
She speaks a various language."

The greatest poets love her. They see something of her meaning and help to open our eyes. Roberts Burns was and is the people's poet, because he could see the beauty and human meaning in every humblest element of nature's boundless whole. His tender, regretful apostrophe to the mountain daisy,—

"Wee, modest, crimson tipped flower,"

and to the little field mouse,

"Wee, sleekit, cowerin', tim'rous beastie—"

disturbed by his plow, touch us—we love such poets, and nature through them. But not all who frequent the rural districts see through his eyes. Many, like another poet, long to be

"As free as nature's first made man,
Ere the base laws of servitude began,
When wild in woods the noble savage ran."

They seek sylvan retreats for the dehumanizing pastimes of hunting and fishing—a survival of those same barbaric times which this poet describes. Not to such, and not to any eye fixed merely on advantages, does nature yield her humanizing influences. For “the eye sees what it brings.” If “the groves were God’s first temples,” and if their interlaced boughs suggested the pointed Gothic arch frozen so many centuries ago into cathedral poems of matchless beauty and religious suggestion, it is also true that in these same ages the woods were the strongholds of savage, lawless life, and the cities, generally speaking, the centers of whatever humanizing influences were abroad in those days. And if we compare metropolitan with rural civilization, while we may grant all that Washington Irving or any other person has said about the nobility of rural occupation, the independence of the life, the first production of values, the freedom from such contaminating associations as are often unavoidable in cities, and the potential refinements from the close association with nature, still, insensibility to nature’s teachings may contravene this benefit, and isolation and the lack of wholesome friction with the world’s action and passion may narrow the horizon of one’s understanding and sympathies nearly down to a geometric point. Our true inner destiny depends not so much on where our lot is cast, as on the mold in which we are cast.

But, given the “love of nature” and “the philosophic mind,” how great the advantages of communion with her “visible form!” Who is there that loves the woods and streams but feels with the poet Wordsworth?

“The world is too much with us; late and soon,
Getting and spending, we lay waste our powers;
Little we see in nature that is ours;
We have given our hearts away, a sordid boon!
And we for everything are out of tune;
It moves us not. Great God! I’d rather be
A pagan suckled in a creed outworn,
So might I, standing on this pleasant lea,
Have glimpses that would make me less forlorn;
Have sights of Proteus coming from the sea,
Or hear old Triton blow his wreathed horn.”

When I have lived for a time the free outdoor life of the forest, it seems to me I will never again submit to the inclosed methods of existence which make one’s house not so much his protection as his prison. The trees become companions. I find my “whispering oaks” and elms and willows, everywhere. They take a human quality, not that of Dante’s grotesque picturing, but a sociable, brooding, protecting, yet lofty and half patronizing companionship which breeds a reciprocal tenderness and respect. Then with what sadness one who loves them must witness their wanton destruction! Longfellow pleaded so eloquently for the life of a beloved elm, but it was sacrificed to the march of needful public improvements. Helen Hunt Jackson sang sadly before her hickory fire:

“O strong, white body of hickory tree,
What do I burn in burning thee?”

But that burning tree warmed and comforted a lover, at least. The birches and hemlocks that “shuddering, trembling,” yielding to Hiawatha’s demands in behalf of his bark canoe, were confederates in a noble art of civilization; the monarchs of the forests that are fashioned into the beams and timbers of our dwellings, roads, bridges, and ships, suffer in a worthy

cause; even the poor little evergreen that is snatched, quivering, from its fellows, and dragged through snows, to be decked with candles and candies and toys for the brief hour of the children's Christmas cheer, fills no mean place in the world's economy. But, to be amid the grand primeval forests, so full of potential wealth and blessing to mankind, and find these nature's noblemen disvalued, contemned; to hear the ring of the woodman's axe, endlessly reverberating through the forest; to see the wedge driven relentlessly into the sound old heart; to see that grand stature of two or three hundred feet pause for minutes long, while the low crack—crack, sounds like the breaking of its heart-strings asunder; and then the awful, slow, but resistless fall of that stark, grand form, striking down upon his sorrowful way a dozen of his comrades and making the very earth to tremble and bellow out in thunder at his blow; or to see one of these trees burning by night, the flames eating out its stately heart by slow degrees of days and weeks, and then running in swift, livid lines to its very crown, till at last it falls feebly upon itself, like a martyr sinking into his funeral pyre, these were sights which would make me shed helpless tears, but which moved the owners with satisfaction that the timber, for which there is yet no market, can thus be disposed of through the agencies of total destruction.

Surely we are in need of some humanizing influence upon our dealings with nature. Not only do we need to impress upon the world the frightful waste involved, but we need, in all ways possible, to foster in the people, especially the young, a sentiment for beauty as "its own excuse for being," which shall breed compunctions against any sacrifice that is not made in the interests of genuine utility. And what a heritage for any child! Well may he say with James Thompson, that passionate lover of nature:

"I care not, Fortune, what you me deny.
 You can not rob me of free Nature's grace;
 You can not shut the windows of the sky,
 Through which Aurora shows her brightening face.
 You can not bar my constant feet to trace
 The woods and lawns by living stream at eve."

That you may learn thus to love nature, go not as a hunter, a despoiler, for savage pleasure's sake, of the gay wealth of life in forest, field, and stream. Go not with eye fixed on any benefit, but simply, as a child to its mother's knee. There stand reverently, and in reverence open the book she offers you—this book, of wondrous binding, wherein is mingled the verdure of forest and the purple of the vintage, the gold of harvests, and the iridescent plumage of all beautiful birds. But open the book, follow her patient finger, and spell out the more wondrous story, written in all lovely and ministering forms, of thy law, thy heritage, thy duty now and here. If we have eyes to see and ears to hear, as we stand under the star-lit dome of sky, or in the noon-dark forest, for man to jolt our elbow and croak a moral in our ear is sacrilege. We can see, we can feel, and no other soul is so close akin to ours as that All-embracing Soul that breathes upon us through these avenues of majestic beauty.

MR. GARFIELD: A practical, hard-headed business man once said to me, it is not the occasional widely spread advertisement, but the constant and persistent one, even though smaller, that sells the goods. Mr. E. W. BARBER of Jackson, who furnishes the next paper, says we must continually agitate and agitate these questions of forestry and we will at last suc-

ceed. Though not exactly appropriate to this connection, I can not refrain from relating an anecdote of Alice and Phœbe Cary, who, returning from school one day, passed where a farmer had thinned a hedge-row and thrown the rejected bushes into the highway. The sisters were moved to pity by the ruthless destruction, especially as to one bush more comely than the rest, and they said, "Let us take this one and plant it over on the other side, for the man who has not enough trees." This simple, beautiful act they did, and watched the little bush till it grew to a handsome tree; and in after years, whenever they returned to their early home, nothing seemed more dear to them than the tree they rescued from the hedge-row and nourished into new life. The Secretary will read Mr. BARBER's paper upon

"REASONS FOR CONTINUAL AGITATION OF FORESTRY QUESTIONS IN OUR STATE."

You ask me to devote an hour's time to the presentation of some reasons for continued agitation of forestry questions in Michigan.

There is nothing new to be said on the subject, and yet it is important that the attention of the public be invited to its consideration, in the hope that a fuller discussion and better understanding of the value of our forests will lead to the adoption of more measures for their cultivation and preservation.

Eight years ago President Arthur called the attention of congress and the people to this question in a few well-chosen words. "The condition of the forests of the country," he said, "and the wasteful manner in which their destruction is taking place, give cause for serious apprehension. Their action in protecting the earth's surface, in modifying the extremes of climate, and in regulating and sustaining the flow of springs and streams, is now well understood, and their importance in relation to the growth and prosperity of the country can not be safely disregarded. They are fast disappearing before destructive fires and the legitimate requirements of our increasing population, and their total extinction can not be long delayed unless better methods than now prevail shall be adopted for their protection and cultivation."

There are difficulties in the way of forest cultivation in this country, under the system of private ownership of the soil and the recognized right of the individual to do as he pleases with his own, that do not exist in some other nations. It is impossible to compel men to plant forests on their own land. The owner of a small farm will clear every acre and depend upon his neighbor, who has a larger number of acres, for forest protection, wood, and timber. It is poor economy for even the forty-acre farmer, as with twenty-five acres of properly cultivated crops and fifteen acres of woodland, his little homestead will be worth more, and will be more profitable, than a treeless forty. Government can not compel the planting of forests or fruit trees. It can not force people to do better. The more government we have the greater are the probable—aye, the inevitable—evils. There is no use of looking to it as an agency for forest protection and restoration. The Anglo-Saxon American will not surrender the liberty of using his own private judgment in the battle of life to the dictation of a majority. The cost would be too great. "Better perhaps," says an anonymous writer, "that the soil should continue to run to the sea than that the example of paternalism should breach the bulwarks of individual liberty."

One good thus excludes another good. With respect to the reforestation of our hills, the freedom a man has to do what he pleases with his own stands in the way of improvement, except through education and agitation, that shall teach land owners their true interests. A considerable percentage of the soil is going to the ocean every year, and the amount is all the time increasing from the destruction of the forests, especially on the hill-tops and the mountain-sides. Individuals, of course, consider their immediate interests, and generally let posterity look out for itself. But, even now, the farmers can not afford to permit the annual washing away of the best elements of the soil into the brooks and rivers to be carried into the great lakes that encircle three sides of the state. Agitation and education, with perhaps an exemption of all reforested acres from taxation by the state, must be depended upon to induce the public to voluntarily take such action in this matter as an enlightened self-interest dictates.

Aside from the conservation of the soil, the agreeable modification of the climate, and beautifying and making more valuable our agricultural lands by the wise enlargement of forest areas, there is the question of timber supplies staring us in the face. As yet we have not known what "a dearth of timber" means. We have not realized the evils, except in the possession of a lot of millionaires, of stimulating by taxation and indirect bounties the rapid destruction of our forest areas. Only now, when our magnificent forests are well-nigh exhausted, do we begin to think about a change of policy in this regard. But we can not escape the fact that every human being, to make life better worth living, must have timber in some form or other for protection and comfort—that our shelter requires timber, the floors we walk on, the chairs we sit on, the tables we eat from, the conveyances we use, the implements needed to carry on the farms—our cradles and our coffins—all, and for all time, must make a demand upon the timber supply of the state and the nation.

When people talk, as they sometimes do, of the inexhaustible forests of any given section of the country, they fail to realize that the sawing capacity of northern mills could in twelve months convert all the merchantable pine in Georgia into lumber, and in six months could use up the pine of Florida.

Not many years hence the great lumber forests of this country will be things of the past. Then the farmer, one fourth to one third of whose acres are covered with growing timber, with a fair proportion of nut-bearing trees, will have not only a valuable windbreak for his crops and cattle, but will surely possess a perennial source of comfort and wealth. Plant hard maples wherever there is a suitable soil. The land in Barry, Eaton, and other counties that has been saved for sugar orchards is now well worth one hundred dollars per acre, while the cleared portion will not bring much more than one third of that sum. Land that was used for pasturage on my father's farm in Vermont, when I was a boy, the original forest having been cleared off, is now covered with second-growth maples and is a splendid sugar orchard, besides being almost, if not quite, as valuable pasture-land as when it was a treeless hillside, and the land is worth five times as much as it was before nature wisely asserted its rights and covered it with a second growth of sugar maple.

Only through the awakening of an enlightened public sentiment, by agitation and education, is there any hope, under our institutions, of good work being done for forest restoration and preservation.

VALUE OF TIMBER PRESERVES AND WINDBREAKS.

Mr. A. B. COPLEY of Decatur: Mr. Glidden appears to be as much in favor of preservation of a timber supply and protection of our farming lands by timber belts as are other speakers, but he prefers, wisely I think, young, growing trees to old and decaying ones. Such windbreaks are a surety of good crops. I know of cases where protected fields have borne good crops repeatedly, while neighboring unprotected tracts of as good soil and as well cultivated, often failed. If one fourth of our southern Michigan prairie tracts were in timber, in belts north and south, the other three fourths would produce more than the whole now does. In those small prairies, the best parts are at the west and southwest, where they were, before occupied, protected by woodlands. The opposite sides, where the wind had full sweep, are often "barrens."

Mr. C. A. HAWLEY of Shelby thought the woman spoken of by Mrs. Bartlett must be a stoic, for he was born near Lake Champlain and never failed to be impressed by its grandeur of scenery. He leaves young trees all about his farm, even in the peach orchard, "to look at."

Mr. S. H. COMINGS of St. Joseph: Mr. BEAL's hint to plant trees in clumps instead of straight, formal rows, brings to my mind the beauty of the blue-grass region of Kentucky. When I beheld it I contrasted it with our Michigan way of planting in rows, and resolved that if I ever set any more trees, I would place them about in groups.

Mr. L. B. RICE of Port Huron: A man with forty acres can scarcely afford to leave fifteen of them to trees, or a considerable part in groves or clumps and keep paying taxes upon them. I would have exempt from taxation all woodlands of one or more acres upon cultivated farms. [Applause.] The barren pine tracts in "the thumb," (the region between Saginaw bay and river and lake Huron) should be bought by the state and replanted or allowed to grow up, as it would do naturally, to poplar and birch. It would protect better lands from the winds of the lakes.

Mr. R. MORRILL of Benton Harbor: I was sorry that Mr. GLIDDEN omitted mention of the financial benefit of leaving timber in belts. Even now, by judicious planting, we can preserve what fertility we have left. I believe that, so far as affording it is concerned, were one third of our cleared land replaced with timber we could make more from the remaining two thirds.

Mr. A. C. GLIDDEN: I believe in such belts, but it is hard to get men to plant them when they see near by their effect in a certain way. I have to throw away the use of three rods wide of land along my row of maples. Most men see only the waste of the three rods of land and do not see the other benefits. One tenth of a man's forty acres in timber would in twenty years yield as great financial return as any other ten acres on the farm. The owner of such a tract can well afford to pay the taxes upon it.

The secretary read the following paper by JAMES SATTERLEE of Albany, N. Y., formerly of Lansing, assistant secretary of the New York state agricultural society, upon

FORESTRY LEGISLATION IN THE STATE OF NEW YORK.

In the winter of 1885 the legislature of the state of New York passed a bill authorizing the appointment of a forest commission. The commission consists of three men, appointed by the governor, who serve without pay.

Their headquarters are at the capitol. The officers of the commission are a secretary, a warden, an assistant warden, two inspectors, and a stenographer. There are also fifteen foresters provided for, whose duties are upon the forest preserve itself.

The argument in favor of the appointment of such a commission was that there were still over 800,000 acres of forest lands belonging to the state, most of them lying in the Adirondack region, and that fires and trespassing were constantly diminishing their value and threatening ultimately to entirely destroy the timber. It was reasonably claimed that a few responsible men put in charge of these timber lands would soon reduce the annual losses to a minimum.

An elaborate set of laws for the guidance of the commission and its officers were embodied in the act creating the commission. Full power to enforce these rules and regulations, and to punish offenders, have never been given to the commission, however.

The commission or its officers, or any other person acting under written orders from the commission, may arrest any person violating the provisions of the act. Each supervisor of a township in which any state land is located, except in certain counties specified, shall be by virtue of his office the protector of such land, subject to the instructions he may receive from the forest commission. Such supervisors are also ex officio firewardens of their townships, with full authority to call upon and direct the citizens in extinguishing any forest fire that may threaten damage. In certain counties mentioned in the act the commission is required to appoint firewardens and their duties and compensation are fixed by law.

Firewardens and supervisors acting as such are required to make a report of fires occurring in their jurisdiction, and to furnish such other information each year as the commission may require; such information is compiled and embodied in the annual report of the commission.

The duties and liabilities of railway companies whose roads run through lands liable to be overrun by fires are specifically defined, and a severe penalty affixed for non-compliance with the provisions or requirements of the act.

Forest officials are to have rules printed and cause the same to be posted in school-houses, inns, saw mills, lumber camps and other places for the prevention and suppression of forest fires.

Provision is made for the severe punishment of incendiaries, and of those who refuse to assist in extinguishing fires, and for injuring trees or timber on the lands of others, and for cutting trees or carrying away timber from any lands belonging to the estate.

So far as I am able to learn, the law establishing the commission works admirably and has been the means of protecting the state lands from serious damage by fire and from serious trespass.

These state lands, however, occupy but a comparatively small part of the forest area of the Adirondack plateau. The balance are owned by individuals—lumbermen, sportsmen and others—and the timber in many places is being rapidly stripped off, leaving the surface to dry up; and when once fire gets in, the accumulated humus is burned from the rocky soil, leaving only a barren waste on which it is impossible for a new timber growth to start. The winds of winter and the rains of spring and autumn carry the little remaining earth away to discolor the mountain torrents and finally deposit the same in bars of sand and silt along the Hudson, and at its mouth in the noble harbor of New York bay. The

porous soil of the forest, which has held the water like a sponge, giving it up slowly in cool, refreshing springs, has gone forever, and in its place only bare rocks remain, which shed the rains like a roof; and in place of the steady even running streams, the entire season through, torrents fill the valleys in time of rain and dry water-courses only are seen in time of drought.

The preservation of this forest area in its entirety has become a vital question. The question has been discussed for years, and in view of the fact that the principal sources of the Hudson are found here, it is a question of greater importance than the preservation of an equal area of forest lands in any other part of our country. The problem of water supply for the cities in its valley will be a problem of furnishing water to ten millions of people in another half century, and there is no other adequate supply save the upper Hudson itself. The navigation of the river is also a question of importance. It is not only a mighty avenue of commerce; but, by many who have seen them, the famous rivers of the old world are less attractive in their scenery than our own noble Hudson. In addition to these considerations, there is the fact that the Erie canal, on which the state annually expends millions of dollars, receives its supply of water, from Rome eastward, from streams that take their rise in the Adirondack forest.

Besides its importance in the preservation of the uniform perennial water supply of the Hudson and other important rivers, the Adirondack forest has become celebrated as a national sanitarium. The health-giving influences of its pines and spruce and balsams and other cone-bearing trees, have become celebrated, and thousands of tourists make it the place of their summer outing. Health and rest and rational pleasure wait upon the invigorating air of its mountains and the delightful aroma of its primeval forests.

As to the desirability of preserving this forest area, there is no question. The most enlightened public sentiment is unanimous in its favor. As to the probability or possibility of its being preserved entire, however, there are grave doubts. Governor Hill, in a special message to the legislature in the winter of 1890, called attention to the matter and recommended the appointment of a special commission to investigate the desirability, and the probable expense to the state, of the purchase of a large tract of land embracing the head waters of the Hudson and other important rivers, a tract some sixty or seventy miles square and including lands surrounding most of those now owned by the state. The recommendation of the governor as to the appointment of a special commission was not concurred in, but the work suggested by him was placed in the hands of the forest commission, and it will be ready with an elaborate report at the opening of the legislature of 1891.

In the meantime the legislature of 1890 made a small appropriation for the purpose of such lands lying contiguous to the state lands as could be purchased at a price not to exceed one dollar and fifty cents per acre. This bill was signed by the governor with the memorandum that it would do no harm and was good as far as it went, but that it was totally inadequate to meet the urgency of the case. Some of the lands in the area mentioned are owned by sportsmen and wealthy men who are ready to co-operate with the state in any effort to preserve the timber. Most of the valuable timber lands, however, are owned by lumbermen who have large investments in mills, and they care little for the preservation of the timber

for future generations. They will, of course, resist any effort to take their lands from them without full compensation, and in many cases, should the state decide upon establishing a great public park, the value of these lands will be placed at an exorbitant figure. Lumbering has been carried on in the Adirondacks, as in Michigan, making a clean sweep of the timber suitable for any kind of lumber, and the lumberman is followed by the charcoal burner and he by the fire of the careless or criminal incendiary, and desolation, and in some cases a barren desert, is the result. If these lands can once be placed in possession of the state and under the control of intelligent foresters trained to their business, the trees that reach their prime can be converted into lumber or charcoal and the balance intelligently protected until such time as they reach their best usefulness. There is no reason why these lands can not be made self-sustaining, but they can still retain the mission that they have held in the past, a protection to the invaluable water supply of the eastern half of the Empire state. If the project of purchasing these lands by the state and converting them into a great state park should fail of its accomplishment, I believe it to be within the province of the legislature to so regulate the cutting and care of this timber area that the evil day when it shall become a desert shall be postponed indefinitely. There is little need that I should say anything to the members of the Michigan State Horticultural Society concerning the desirability of the people of Michigan taking steps at once to retain some of the original areas of their grand forest lands. The opportunity will soon be gone forever. There are but few localities now in the Lower Peninsula where a half dozen townships could be obtained in a single body. An organization should be perfected at once, looking toward the selection of the largest area of wild lands that could be obtained at the head waters of the Manistee and Au Sable rivers, and the matter presented in its strongest light and with the sanction of the State Board of Agriculture, and the Michigan State Horticultural Society, to the legislature, and to seek its aid by every honorable means in the establishment of a forest preserve. Failing in this, then seek the aid of public spirited men of wealth to purchase the land and set it apart for a private park to be kept for a game and forest preserve. But the effort to interest the legislature in the project ought not to be a failure. It certainly falls within the province of the people of the state to establish such a park, and such a movement would meet the approval of all such as love the forest for its own sake. It might be made to illustrate what can be done by the intelligent care of forest lands in the preservation of their natural beauty, and at the same time increasing their actual value as a source of timber supply. It would meet the approval of those who would still like to see some of our beautiful wild animals preserved from total extermination, and it would meet the approval of every practical man living along the borders of those rivers and dependent upon their even, perennial flow in the future for the continued success of his business enterprises.

Following this, the subjoined paper by Prof. W. J. BEAL of Michigan Agricultural College was read by the secretary:

SOME OF THE REASONS WHY THE STATE SHOULD OWN A FORESTRY RESERVE.

1. The virgin forests of Michigan are very fast disappearing or being disfigured by partial cutting, burning, or pasturing.

2. Owing to the almost universal practice of mowing along railways; of mowing, pasturing, or cultivating each side of the highway clear up to the track, and of pasturing wood lots, our growing trees and shrubs and wild herbaceous plants are exterminated or disfigured or kept in check.

3. There are many very interesting and profitable things to be learned by a thorough study of a native forest, and these will be more and more as time advances, as timber becomes scarcer, and some of our citizens become more interested in forestry. Even now, in some countries, long journeys are made with view to studying trees.

4. Such a reservation, if properly cared for, should exhibit one or more good methods of management in regard to prevention from fire, methods of cutting or thinning.

5. In addition to the native tree, samples in smaller or larger quantities of other hardy species of trees and shrubs, could be introduced, adding to the interest of the subject.

6. Most likely the forest would be located at the source of some one or more small or large streams, and thus be of value for illustration and study of its effect on the water flow.

7. Such tract should very properly be the protected resort of certain kinds of wild animals of interest to naturalists and sportsmen, perhaps including some animals introduced from other countries.

8. To some extent, such a reserve is a botanic garden, and of special interest to every horticulturist, botanist, or lover of nature.

9. There is a time coming when many of our people will appreciate such a reserve, and will be as eager to make pilgrimages thereto as the sportsmen now are to make trips to the wilds of the state to shoot deer and other animals. To a person properly trained, there is just as much interest in hunting for wild, rare, or beautiful trees and plants, or snails, slugs, and insects, as there is in shooting deer or in catching grayling, trout, or bass.

10. If properly selected and cared for, such reserve or reserves will help solve the perplexing problem soon to present itself forcibly to the minds of our citizens, as to whether the state should not own much of the forest, or at least have something to say in regard to the removal of the young timber.

11. We might very properly have more than one such reserve, in widely distant parts of our state, including, if possible, one or more islands.

12. The selections can mostly be made where the state now owns a large proportion of the land, and it may very well be made where the land is variable, including swamps, marshes, or small lakes.

13. Land can now be obtained at a moderate cost, and the longer the delay the greater the cost and the greater the difficulty in securing suitable locations. Long delay will also serve forcibly to cause deep regret that somebody had not foresight enough long before to waken an interest and take action in this matter.

Mr. N. A. BEECHER of Flushing: I am heartily in sympathy with any measure that has for its object the protection of the forests of either peninsula. As to the demand for lumber, it may not be greater than it was years ago, as claimed by Mr. GLIDDEN, but the quality of the supply is very different from that of 25 or 30 years ago. The yards contain much lumber which then would have been rejected as worthless. Then scarcely any hardwood was cut; now it is common to see the mill-yards full of hardwood logs, and in some sections there is scarcely any

timber of any sort left. PERRY HANNAH of Traverse City has said that the hardwood of the state is worth more than ever was the pine. I thought the expression an extravagant one at the time, but have concluded he was right. I know of a tract of land which was cut over to furnish oak ties for the Michigan Central railway when it was constructed. In less than 20 years the same was cut over for the same purpose and yielded over \$400 per acre.

Mr. L. B. RICE: It would be good policy for the state to retain lands bid in for taxes, put them in charge of foresters, protecting the timber and benefiting the whole country.

Mr. S. H. COMINGS: Is there as much evaporation of water from trees as from grasses, plants, etc., which take their place when cut?

Prof. L. R. TAFT: I am unable to answer exactly, but it is believed that trees retard evaporation and so retain more moisture than they give off. But a comparative statement between trees and grasses can not be made.

Mr. C. W. GARFIELD: Some of our millionaires, who have been made such by cutting off our forests, should take the present opportunity, secure some of the lands, and offer them to the public as a park, instead of piling up bricks in colleges as monuments to themselves.

Adjourned till nine o'clock Wednesday morning.

Wednesday Morning's Session.

At the opening of the session of Wednesday morning, a letter from Mr. C. H. RICHMOND of Ann Arbor was read. Mr. RICHMOND is one of Michigan's World's Fair commissioners. He said only ill health prevented his attendance upon the meeting, and gave assurance of deep interest in the proper showing of Michigan horticulture at the fair. A letter from Mr. D. G. EDMISTON of Adrian expressed regret for non-attendance, and said, as to the World's Fair, "I think I am safe in saying that you may rely upon Lenawee county to do her full share. It will be Michigan's fruit-bearing year and she ought to do her best."

SOME QUESTIONS ABOUT GRAPES.

Three questions were submitted by Mr. W. F. BIRD of Ann Arbor:

1. *Has the Ulster Prolific grape developed any weak points as to health or hardiness?*

There was no response.

2. *What is the cause of hollow-stalk in celery?*

Mr. W. W. TRACY: It might result from several causes or treatments. One is too early planting, causing maturity in hot weather; another is too early earthing.

Mr. JONATHAN WILSON: Poor seed might cause it, or the fault may be in the variety.

3. *Have different soils any effect upon the keeping quality of grapes or other fruits?*

Mr. S. H. COMINGS: It makes all the difference in the world with cranberries. In New Jersey it has been noted that they rotted quickly when from the soil of one side of a ditch but kept long when from the different soil of the other side.

Mr. WM. V. GREEN: Grapes from heavy, strong soil keep better than those from light soil, and it is the same way with apples.

Mr. COMINGS: Prof. Budd says that in Russia they know that some apples must be on one kind of soil and some on another.

Mr. R. MORRILL: It is generally understood that all fruits on clay soil keep better than the same grown on light soil. They "stand up" better in marketing. But they are not necessarily of better quality.

Mr. J. N. STEARNS: Their quality is much better when grown on sandy soil.

Mr. E. H. SCOTT: This is only because, with the later fruits, our usually short seasons prevent them from fully ripening upon clay.

Mr. STEARNS: Grapes on sandy soil are a finer quality—more sugary—when not highly fertilized with stable manure than when they are so fertilized.

Mr. A. C. GLIDDEN remarked upon the superior quality of the grapes grown at Lawton, where they are upon warm, sandy soil of high lands.

Prof. L. R. TAFT: There is a difference, too, in quality of grapes grown upon the same general kind of soil. Addition of potash to any soil will double the amount of sugar in grapes.

Mr. S. M. PEARSALL: Perhaps the slower growth of fruits on heavy soil give them their superior keeping qualities.

Mr. L. B. RICE: Western New York apples are celebrated as long keepers, and the best of them are grown on sandy or gravelly soil.

CELERY CULTURE.

Introducing the celery question, Mr. JONATHAN WILSON of Kalamazoo read the following paper:

CELERY CULTURE IN KALAMAZOO.

A few years ago celery was counted a great luxury, but Kalamazoo has gone into the cultivation of it so extensively that it has become as common as wheat, oats, or any other staple article. Thirty years ago there was probably not a stalk raised in Kalamazoo or Kalamazoo county. Twenty years ago a few individuals grew a few stalks, more for their own use than as a commodity for the market, but if they had a little surplus they would try to force it upon the market at ten times the price that our gardeners are receiving for it now. About fifteen years ago, or more, a little more interest was manifested in its cultivation, and a little effort made toward shipping a few stalks. Three years later the enterprising shipper, Mr. J. F. FARNUM, opened the ball. [I have no desire to create any bad feeling or draw out any controversy among the shippers.] Mr. FARNUM ought to have the credit of being the first man who started the shipment of celery from here and made it take the appearance of a business. Since then the raising and shipping of celery has gone on hand in hand, one helping the other, till it has shaped into a business for the benefit of the place second to none other; and while it is a business that has done much good, and is a benefit to Kalamazoo, it would be well to bear in mind that there is a

great deal of labor and expense attending the raising of celery. In this place it has almost taken on the shape of a co-operative institution, as it is carried on principally by one class of individuals. Every once in a while one or another will try to claim the credit of starting the enterprise. Be that as it may, I like to give honor where honor is due. Had it not been for the persistent and well-directed labors of our Holland citizens, our marshes would have remained in their wild and uncultivated condition up to this time; and it has not only been a benefit to the land, as to its value, but a benefit to the health of the community at large in the drainage of our marsh, carrying off the miasma and making it as possible and almost as pleasant to live upon as the uplands.

DRAINAGE.

In speaking of drainage, some lands have become too dry. For such, a thorough system of tiling would be a benefit in two ways—for drainage, in wet times and irrigation in dry times by having tiles so arranged that they can be stopped at the lower end, which would throw the water to the surface and wet the land more or less, according to the supply of water; and right here I will take the privilege of flying off the subject to throw out a hint to our farmers, as the above plan could be adopted by them, and we need not go without corn in Michigan, as we have plenty of water, if we will only draw it up and use it. Of course, I am speaking to those who have level or comparatively level land and water a reasonable distance from the surface.

AREA IN CELERY.

Taking a rough estimate, there are about one thousand acres within a radius of four miles, in and about Kalamazoo, that are used exclusively for celery. Two hundred dollars per acre is an average crop, so it does not take long to figure up the aggregate; and the beauty of it is, the most of this money remains at home, to be taken up by our merchants, and a good or bad crop is very manifest to all parties interested.

METHODS OF CULTIVATION.

In looking back twelve years, there has been very little improvement in the cultivation of celery. Some few changes have been made, such as using boards for blanching and greenhouses for raising the plants. These are two of the most noted changes that have been made. When all the good points of paper or parchment are understood, I think they will supersede boards, as they can be used to protect the plants both early and late in the season.

About our method of raising and cultivating celery, little more can be said that has not come out in pamphlet form or in our different agricultural papers; yet I do not think this article would be complete without a little description of some of the hard knocks we have to go through with before we have this pleasant and healthful plant ready for the table. From the first to the tenth of March we prepare our hot-beds or greenhouses and sow the seed. Attending to the preparation of the land and drawing the manure is the first work of the season. Between the time of sowing and setting the hot-bed plants, we make another sowing out of

doors to give us plants later in the season. This sowing comes from the first to the middle of April. The first plants from the hot-bed we commence to set about the tenth of May; the out-door plants, when they are ready, some time the fore part of June. We prepare our land as you would for any ordinary crop, spreading from forty to fifty one-horse loads of manure to the acre (the bigger the loads the better). Then we drag and "plank" the land, then mark it out in rows five feet apart, setting the plants in the rows from four to six inches apart. After we are through setting, we take good care of the land, keeping it perfectly clear from weeds, and when the celery is about one-third grown (that is, the first crop) we commence to set the second crop in between the rows of the first. When the first crop is large enough, some time the latter part of June, we commence to set the boards against it for the purpose of blanching, one on each side, clamping them at the top edge. Then with a hoe draw the earth close up to the lower edge to keep the air from passing up, as this would prevent the celery from blanching. It takes from two to three weeks to blanch the celery with boards, so by the fourth of July, if the weather has been favorable, we can have some ready for market.

We calculate to be all through setting plants by the first of August. The writer would say that he has seen better results when the setting out stopped the middle of July. Sometimes we set out a third crop in between the second. When the land is all clear of the first crop we commence to blanch with earth, say about the first of October, and get all through by the middle. From the time the first plant is set in May, until the last plant is gone in January, is about as hurrying times as a body needs to pass through. At least this has been my experience.

One thing that has puzzled us is the keeping of celery through the winter till spring, and it not only troubles us, but others all over the country. One gentleman wrote me from Dakota asking our best method for keeping even for a little while into winter, and I gave him our method, but it would not work there, as the temperature would be like spring one day and twenty degrees below zero the next, making it necessary to cover deep enough for one of our steady-going winters one day and uncover the next for a June day. So, you see, nothing but eternal vigilance and hard work would give that man celery. The best method we have found is to make a narrow trench, say one foot wide, and set the celery up as straight as possible, drawing the earth up carefully on each side and covering as the severity of the weather requires. Some claim better results from burying in the sand, others think that they have better success on the marsh. Surely it is a big undertaking, for a man who has forty acres, to hunt up a sand bank in which to secure his crop. Other points of interest might be taken up and discussed, such as the best kinds of celery, the best kind of machinery in the shape of plows, cultivators, machines for hilling up, digger for taking the stalks from the earth, etc.

To a question Mr. WILSON answered that early sown celery was not more subject to hollow stalk than that sown later.

Mr. FRANK LITTLE of Kalamazoo, read his paper which follows in full:

Some five years ago, at the request of the commissioner of agriculture, I prepared a paper describing in detail the method of celery culture at Kalamazoo. This was published in full in the annual report of the department for 1886.

Accompanying this sketch I sent the department a carefully selected sample of celery soil for analysis.

In the published report of the analysis by Mr. H. W. Riley, the chemist, he says: "The culture of celery in this country, especially in Michigan, has grown to be an industry of considerable importance. In the neighborhood of Kalamazoo, Michigan, are some of the finest celery gardens of the world. To determine the character of the soil in which this celery grows, a carefully selected sample was obtained from Mr. Frank Little of Kalamazoo."

The analysis gave the following results:

ANALYSIS OF THE SOIL.	
Substances.	Per cent.
Moisture	7.105
Hydrated silica	1.885
Ferric oxide	1.880
Phosphoric acid .....	.470
Potash .....	.206
Chlorine .....	.091
Volatile and organic matter	52.342
Quartz sand	23.845
Soluble silica .....	.175
Alumina	3.237
Lime	4.574
Soda .....	.463
Sulphuric acid .....	.601
Carbonic acid .....	.408
Nitrogen	2.660

The great percentage of nitrogen in this soil will be noticed, which leads me to the conclusion that soils containing a large quantity of organic matter are particularly adapted to the growth and culture of celery.

HISTORY OF THE INDUSTRY AT KALAMAZOO.

The celery gardens of Kalamazoo are located upon the bottom or marsh lands that skirt the river and its tributaries. It is estimated that there are in the city and township 3,000 acres of bottom land, a large portion of which is adapted to the cultivation of celery. This marsh soil is of inky blackness, peaty, in some instances strongly impregnated with iron, and in others with marl or carbonate of lime.

□ The saturation is copious as a rule throughout the season, owing to porosity of soil and the elevation being but slight above the river level.

In 1875, or thereabout, a native Hollander by the name of Lendert De Bruyn, who had carried on a small upland garden and tried to raise a little celery, ditched and spaded a narrow strip a few feet wide and two or three rods long of marsh at the rear of his lot on South Burdick street, and set out a few plants of celery as an experiment. His success was so marked that the next spring three or four other Hollanders in like manner prepared a few rods of ground with like results.

Stimulated by the uniform success that had attended these efforts, and a market being opened abroad by some enterprising dealers, a large number of Hollanders soon embarked in the work. Large tracts of marsh-lands were ditched, subdued, and planted out to celery up and down the valley. Marsh-lands advanced rapidly in value from a nominal average price of \$30 per acre to three, four and five, hundred dollars per acre.

At the present time, July, 1885, the total area of celery lands under

cultivation within the city limits and suburbs is estimated at 1,200 acres, furnishing employment in this special industry to upward of 2,000 laborers, besides a great number of women and children.

Notwithstanding this remarkable expansion and wonderful success attending the growth of celery in Kalamazoo, notably so within the past five years, the possibilities of the future have only been half realized. While the annual acreage is rapidly increasing, stimulated by a brisk, profitable demand for shipment, large areas of land, probably 1,200 acres or more, suitable for the cultivation of the plant, are still unoccupied.

CULTURAL METHODS.

It is no genteel, light, clean work or child's play to grow celery. The drainage and subjugation of the natural soil, fertilization, planting out, and subsequent cultivation and gathering the crop, almost entirely hand work from the commencement to the close, is laborious in the extreme.

At first narrow open ditches are dug at right angles to the stream or principal drain, at intervals varying from ten to thirty rods, as the case may require. The intermediate spaces between the ditches is then thoroughly dug up by hand, or by plowing in some instances, covering underneath the wild coarse grass, weeds, flags, and rushes, preparatory to setting the plants.

Horses shod with broad wooden shoes made of two-inch plank are sometimes used in plowing drier portions; also, sometimes, where too wet and miry for a team, a capstan set on the upland, with a long cable attached to a plow, is used, and a wooden tramway is laid for a light car to take the plow and cable back to the starting point, and for the transportation of manure, boards, tools, plants, etc., upon the field; but this is not the common practice now, as the marshes are drier than formerly.

Most of the labor in the celery gardens is done by Hollanders—men, women, and children—who, in wooden shoes, bid defiance to malaria and diphtheria, and seem to be perfectly at home as they dig in the mud and water and plow over the moist celery fields.

In winter, when the marshes are frozen, large quantities of straw and stable manure are drawn out to the celery fields, for spring and summer use. Manure, which has appreciated in value largely within the city limits since the development of this enterprise, is an essential feature of success. It is used liberally at each successive planting to promote the growth of the crop; and it is found that artificial fertilization here can not be profitably dispensed with.

Celery seed is quite small and slow to germinate. Some growers raise their own seed, but a large number purchase it each year at a reliable seed agency.

There are many varieties, with scarcely essential differences. The most popular named varieties at Kalamazoo are the Golden Dwarf, White Plume, and White Walnut.

Seed is sown in March in hot-beds; later on, in shallow boxes, and a finely prepared seed-bed outdoors. The seed should be sown in straight rows, so that the young plants may be kept free from weeds. When about two inches high they should be thinned out and transplanted two inches apart, and when four inches high the tops should be cut off, which will cause them to grow stocky.

Thorough cultivation is implied where celery has been raised upon any given tract the previous year.

In planting out, well-manured, broad, shallow trenches about seven inches deep, parallel to each other and five feet apart—in some instances these trenches are only three and one half and four feet apart—are usually prepared; and the young plants are set in the trench at intervals of six inches, the outer leaves cut off, and the soil pressed closely around the roots.

Early plants are set in May, as weather permits; second crop in June; and third and last planting, for winter use, last of August and first of September.

Onions, peas, and potatoes are extensively planted between the trenches of the first crop, to be harvested before the celery needs hilling.

In about six weeks from setting out, the plants may be "handled," one man gathering the leaves together tightly, while another draws the earth from between the rows about the plants one third their height. The process is repeated in dry weather every few days until ready for use. Care must be taken that dirt does not fall between the leaves in hilling as rot may ensue.

The hilling of the first crop excavates a trench, along which the second "planting out" is set before the first is harvested.

The first crop is usually ready for market by the 10th of July, and all gathered by the 1st of August. The soil is then taken from the first row for hilling the second crop. If the season is favorable, a third crop is planted out the first of September upon the first line of trench.

BLANCHING AND MARKETING.

Blanching in the field is done either by hilling up the plants with earth, as previously described, or by boards placed each side of the growing plants, and held together by iron hooks or clamps. Where boards are used there is less liability to rust, but the celery is said not to be equal in quality to that which is hilled with earth.

At maturity the celery is dug, trimmed, washed in sluices running through the fields, securely tied in bundles of twelve heads, boys and girls being usually employed in this work, and delivered promptly at the shipping agencies, fresh from the field every day, just prior to departure of express trains.

At the agencies the celery is immediately packed in thin wooden boxes of uniform size, ten bundles of twelve heads each, duly branded "Kalamazoo celery," and sent at once to the express trains.

In the height of the season 40 tons have sometimes been shipped from Kalamazoo of celery thus packed in one day.

It is important that celery reaches its destination in as fresh and crisp a state as possible. The utmost celerity is therefore requisite, from the moment the plants are lifted in the field, to hasten them to market in an attractive form and good condition. There are nearly thirty business firms engaged in the shipment of celery from Kalamazoo. These agencies buy the celery outright at a certain price per dozen heads, and it is then sold in quantities to fill orders or consigned for sale to commission dealers.

CARE IN COLD WEATHER.

As the season advances and freezing weather sets in, all the plants that remain in the gardens are lifted from their original bed and stored carefully away in the winter cellars or "coops." These winter repositories are built to exclude the frost, and have facilities for lighting and for heating in extreme cold weather. They are built usually 24 feet wide, and are 100, 200, or 300 feet long, as the case may require.

In constructing these "coops," which are built on dry land near the gardens, the earth is excavated about two feet below the natural surface for the entire area to be inclosed. The sides are boarded up above the natural surface two feet to the eaves, making side walls four feet high inside. A ridge-pole, six feet high, is duly supported through the center, and fourteen-foot boards are used for roofing, occasional openings being made in the roof for windows and ventilation. The outside is well banked up with earth to the eaves, and the roof covered with straw and manure to exclude the frost.

In housing the celery for winter, beginning at the back end of the "coop," the plants which are green and small as they are selected from the field are first packed away at the further end, standing closely and upon their roots, slightly sprinkled with earth, and moistened to keep them growing. To prevent heating, the plants, as they are stowed away, are divided into narrow sections by boards set edgewise. Green and immature plants are always placed at the back end, so as to be the last to come out in the early spring, when the season closes, while the large, mature heads are saved to go in last near the door.

In this manner the "coop" is filled to the entrance with one or two hundred thousand dozens of plants, more or less, as the case may be.

The proper management of these winter cellars is a very important feature of the enterprise, and requires constant vigilance and excellent judgment to regulate the light, heat, ventilation, and steady successful bleaching of the plants.

Another method of winter storage is sometimes practiced by digging a trench two feet deep, two feet wide, and any desired length. The plants are then packed uprightly upon their roots in the trench as closely as they will stand, and covered with straw, earth, and manure to exclude frost.

While celery thus secured is said to be preferable, there are serious objections to the method in this latitude. For the plants, long excluded from the air, would smother and decay, there would be danger from frost, and they would be inaccessible many winters in case of protracted periods of very cold weather.

The winter demand for celery for shipment, especially during the holiday season, is constant and unabated; and the "coop" system enables the grower to obtain access to his stock every day, even in the coldest weather, and note its condition and prepare it for market, until the crop is exhausted.

Kalamazoo celery is now shipped to nearly every state in the Union. The regular season commences about the first of July, and, being prolonged by the practice of winter storage, lasts until the succeeding March or April.

The annual product of celery at Kalamazoo is now estimated at upward of 1,200,000 dozens, and valued at \$250,000.

IN CONCLUSION.

Kalamazoo celery takes high rank in the various markets where offered. It is remarkably uniform in size and quality; of luxuriant, rapid growth; crisp, aromatic, nutty flavor; and is generally sound and free from rust. Large, thrifty heads are generally more salable, but a medium size is to be preferred as being more tender and solid. As an esculent, it undoubtedly requires a cultivated taste to relish celery, but this taste is readily acquired; and as a condiment and appetizer, to say nothing of its valuable medicinal properties, celery stands unsurpassed.

The foregoing sketch of the rise and progress of celery culture in Kalamazoo but imperfectly delineates the development of an industry that has proved of great practical value not only to this locality, but, the success and fame of the undertaking having gone abroad, elsewhere in this state and in other states, the more extensive cultivation of celery has been stimulated in view of what has been accomplished here.

Land, much of it heretofore considered comparatively worthless, the original home of venomous reptiles, noxious weeds, swamp fever, and malaria, has been drained, brought under cultivation, converted into arable fields and luxuriant celery gardens.

While some of the drier portions of the Kalamazoo marshes were available for pasturage and meadows in dry seasons, yielding a coarse marsh grass of inferior quality, many large tracts that have been reclaimed were but a few years since wet and miry, almost impassable for either men or animals, and the idea of converting these lands to any practical use in the direction indicated would, a few years since, have been deemed visionary and absurd in the highest degree.

VARIOUS REMARKS.

Mr. WILSON spoke of the fact that while "coops" were, at the time Mr. LITTLE's paper was written, used for storage of celery, they were altogether abandoned because of resulting heavy losses by heating and rotting. He also said that celery blanched by earth instead of boards, in the summer, was unpalatable because bitter.

Prof. A. J. COOK: One point has not been touched as yet, the keeping of celery for family use. I put earth on the cellar bottom and set the celery upon it, in rows with boards between to prevent rotting, placing a few tiles among it, into which to pour water to moisten the earth and keep the celery fresh. It will not do to wet the stalks or leaves. It would cause rot.

Mr. TRACY: When do you sow the seed for early July celery?

Mr. WILSON: From the first to the tenth of March.

Mr. LITTLE: To keep celery for domestic use, don't trim it much and pack the roots in moist sand.

Mr. WILSON: Soil impregnated with iron will cause rust.

WHAT IS IN VARIETIES?

Mr. TRACY: A very good author once said that were a man blindfolded and given several varieties of celery to eat he could not tell the difference between them. But I tried the experiment with several persons and found this author mistaken. There is a marked difference in flavor

between varieties. I asked several growers at Tecumseh which was the best variety, and they said they preferred Early Self-blanching for their own use. No one chose White Plume, though every one grew it for market. Out in Nebraska I found farmers selling corn for eight cents per bushel and buying Kalamazoo celery. Yet any farmer can grow celery in his garden. Take a piece of ground, manure it heavily with stable manure, set the plants in slight trenches four feet apart, earth it up as much as you can while it is growing, and finish blanching with boards. Leave it right there for winter, covering with boards and stable manure and digging out as wanted, throwing the manure into the adjoining spaces and setting the plants there the next year. To keep celery in the cellar, bore holes four inches above the bottom of a barrel, put in an inch or two of earth, pack in the celery tightly and pour in water until it runs out of the holes, and add water as needed afterward, but do not throw it over the stalks.

Mr. STEARNS said he believed White Plume celery had been a detriment to the celery business in Kalamazoo because of its poor quality. He keeps celery by Mr. TRACY's plan.

Mr. MORRILL: Out of the 30,000 plants per acre, how much is waste?

Mr. WILSON: I can not say—perhaps five per cent. An insect has lately appeared which attacks the stalks, killing them, until cool weather begins. There is also some kind of blight which is increasing. Some early kinds sometimes go to seed in the July crop but White Plume does not. In my own family we only eat the heart of White Plume celery. White Plume and Hartwell's Perfection are the only kinds grown at Kalamazoo. Strawboard will do as well as lumber for bleaching, but use of it is patented. Tiles are not as good as boards because they smother the plants.

The secretary read the following paper by Mr. M. WETTERLING of Ionia, which was accorded very hearty applause at its conclusion.

THE GROWING OF CELERY—HOW I DO IT—BY AN AMATEUR.

When our worthy secretary requested me to prepare a paper on the cultivation of celery, I must confess that I felt rather embarrassed, especially when I heard it was to be delivered at the greatest celery market on the American continent, from whence carload upon carload is sent daily to supply the wants of the American people throughout the length and breadth of our land, Ionia excepted; and then, when I learned afterward that I was to follow, perhaps, one of the old celery veterans, the very champion of our Kalamazoo celery gardens, after he had exhausted the subject, I felt like giving up in despair; but my name was on the list, therefore I must do something, and so I will tell the way I do it, though it conflicts somewhat with all authorities I have seen or read on this topic, and may seem impracticable and perhaps presumptuous, but I shall simply give my experience to be accepted or rejected as may seem best.

PREPARING THE SOIL.

I prepare my soil thoroughly in the fall, using well decomposed stable manure freely. If for short, stocky celery I use cow manure, if tall celery is wanted horse manure is used. The soil for my seed beds I lay up in

high ridges in the fall, and the first warm days we have in the spring thaw these ridges out very quickly so they can be leveled down and the seed sown.

SOWING THE SEEDS.

I make rows crosswise on these beds eight inches apart and sow my seed thinly if the seed is fresh, thicker if old. I would not risk seed over three or four years old. After my bed is sown I tramp down the seeds firmly with my feet and level the ground afterward with the back of the rake.

CARE OF THE PLANTS.

As soon as the tiny plants begin to show themselves I stir the soil carefully with the "Excelsior weeding hook" between the rows to keep down the weeds and to admit the warmth from the sun. As the plants grow a little larger I thin them out carefully that they may not crowd each other or grow spindling. A spindling plant is worse than useless. I would rather pay fifty cents per hundred for short, stocky plants than risk spindling ones as a gift. Success or failure depends upon the care which the plants receive in their earliest infancy, so to speak. I shear the tops back twice before setting them out. This secures strong, healthy plants with an abundance of fibrous roots which take hold of the soil at once after being transplanted.

TRANSPLANTING.

Here is where my practice conflicts with that of other growers, and I shall give my reasons for adopting it. About ten years ago I first tried to grow a few hundred plants, which was considered a great crop at that time. When I got ready to set my plants I went to consult an old, gray-haired Englishman, who lived a few miles away and who had been engaged in growing celery in "Old England" from his boyhood, but had not grown any in this country as yet. He seemed rather reluctant about telling his secret, but being on good terms with the old man, and promising him solemnly to keep the secret to myself, he told me in strict confidence the whole process. I went home rejoicing in heart and began operations at once. It would seem a rather hard task now, but then nothing seemed impossible to me. I worked away like a beaver at my trench, which was to be two feet deep and a little over a hundred feet long. My enthusiasm was beyond expression. The work was easy and in three hours the trench was done, and as there was prospect of rain I proceeded to set my plants, after having done which I felt like having done a good day's work. I already began to figure out in my imagination what a handsome profit that hundred-foot trench of celery would bring me, and pictures of mammoth white stalks, such as the old man had raised in "Old England," presented themselves before me. Of course, I did not cover up the trench, as I wanted the plants to get the full benefit of the rain. We had an unusually heavy rain that night and I went out bright and early the next morning to see how my plants were doing, when lo and behold! my trench was full to the brim with water. That finished my celery-growing for that season. I felt like exclaiming with the preacher of old: "All is

vanity and vexation of spirit." The next season I did not make any trenches at all, but set my plants on level ground, the soil thoroughly prepared the fall previous, in rows four feet apart. The celery grew beautifully, and I hilled it up gradually as the "books" recommended, but when it was fit for digging I found it was so rusty as to be almost unsalable. Then I made up my mind to care nothing for the "books" and tried an experiment of my own. I made the rows one foot and a half apart, and set the plants six inches apart in the row, and worked them until they were half grown without filling them up. I never saw celery grow so fast, each plant trying to grow taller than the others, as they had no room for spreading themselves, and by fall I had as fine a crop of celery as anyone would wish to have, white as snow, tender and brittle, and of the most delicious flavor. Such celery will never beg for a market. I have stuck to this practice ever since, and I shall stick to it until I find a better way. I set my plants in July after I have gathered a crop of early cabbage, beets, or lettuce, as my ground is limited and every inch must be made use of.

KEEPING IT THROUGH THE WINTER.

I dig pits one and a half foot wide in some place where the water will not stand, and deep enough so that the tops of the celery will be level with the ground, being careful not to handle it while wet, as it is liable to decay if put in while damp. I leave it exposed to the weather until hard freezing sets in, when I cover it with boards and straw. Thus it will be accessible any time in the winter.

VARIETIES.

Every year some new variety is added to the already too long list of celeries. I do not think there is a variety to be found to exceed the old favorite, the Golden Heart or Dwarf. The White Plume is a very valuable variety for early market, but its flavor is inferior. The Golden Self-Blanching is very sweet and juicy, but a very poor keeper. The Kalamazoo and Perfection Heartwell are both excellent varieties and good keepers. Henderson's New Rose is a beautiful pink variety, very sweet and nutty in flavor, but will not sell, at least not in this market, as long as there is any white celery to be had. The Giant New Pascal is but lately introduced, and I think it will be a very valuable variety.

Now I have given my way of growing celery and I suppose there is no use of my trying any more to compete for premiums at the Detroit Exposition or any other place.

By the way, I presume you all know that Michigan carried away all the celery premiums at Vick's great exhibition at the Illinois state fair which was held at Peoria, where every state in the Union was represented, also Canada. Michigan came out ahead of them all. Our state also took first and second premiums on cabbage, and first on potatoes. I will give the figures as they came to me from the report, beginning with the Empire state, which carried away \$205, Wisconsin \$125, Iowa \$150, Illinois \$65, Massachusetts \$75, Dominion of Canada \$35; and now comes our own state with \$310, or thirty-one per cent. of the whole thousand dollar premium, of which Barry county took \$110, Jackson county \$110, and Ionia county \$90.

Have we not reason to be proud of our own beloved state? Talk about

the gold mines of California! We have gold in Michigan if we will but "dig" it out. Our hills produce the finest fruits on the continent. Our valleys bring forth the best grain and vegetables in the Union; our pine forests furnished lumber superior to any other state; our iron and copper mines are the richest in the world; and, last, but not least, our marshes and swamps, which but a few years ago were pronounced worthless, now supply over sixty-three millions of people with—celery.

PEACH YELLOWS IN MARYLAND AND DELAWARE.

The following paper by Prof. L. H. BAILEY of Cornell University and the New York State Experiment Station was read by the secretary:

I suppose that the largest peach-growing region in the world lies in Delaware and the Chesapeake peninsula. America is peculiarly a peach country, and this mid-region of it appears to be one of its very best portions. The soil is light and warm, the climate mild, and the rainfall abundant. The trees, therefore, attain a great size and age and they are almost uniformly productive. Six-year-old trees in the Chesapeake peninsula are about as large as eight and nine-year-old trees in Michigan, and as a rule, especially when young, the trees appear to have a more upright habit of growth. The peach season is from a month to six weeks earlier than the Michigan season.

The markets are unusually good. Shipments are made chiefly to New York, Philadelphia, Baltimore, and Washington. To a large region lying east of Chesapeake the bay affords direct water communication with Philadelphia and Baltimore. Peaches have been almost uniformly profitable in this region between the Delaware and Chesapeake bays until the yellows scourge has overtaken it. Many spacious residences are monuments to the profits of peach culture, and a number of important towns originated as shipping points for peaches.

The orchards are usually larger than the Michigan orchards, especially in Maryland. The extensive methods of farming which prevailed in slave times are still largely in practice, and it is not unusual for one grower to own a hundred acres of orchard, and sometimes they are much larger than this.

Necessarily, the homesteads are widely scattered, and in this fact is to be found the chief hindrance to the control of yellows.

Yellows has been known in the neighborhood of Philadelphia for a hundred years and more. It has spread slowly until comparatively recent years because orchards were small and isolated. Shortly after the war, however, peach-growing began to attract great attention and large orchards appeared in southern Jersey, Delaware, and eastern Maryland. Soon yellows began to spread. At first it was not recognized as a specific or well-defined disease, and it has never been seriously fought. As a result, the peach interest has been constantly driven further south, it has become precarious in all the older peach regions, and in many sections it has been abandoned. It has been practically given up in northern Delaware and adjacent Maryland. The southern half of Delaware is now the center of peach-culture in that state. This fact is well attested by the compromise made upon the yellows law by the last legislature. Some growers in the northern half of the state opposed the law, because, it is said, the remaining orchards were so much diseased that nearly all the trees would have to come out if the law were passed. As a result, the law applies only to the

southern half of the state. This is certainly a most important and dangerous compromise, as it constantly exposes the southern orchards to infection from the north. But it is better than no law, and the prejudice against it will no doubt soon disappear. An attempt was made in the last legislature to make a law for Maryland, but it failed. The effort will be renewed, and there are evidences that the enactment will soon be obtained. But the operation of the law will be much delayed by the isolated nature of rural estates and the prejudice of the people.

To all appearances, yellows in the Chesapeake country is the same as in Michigan.

But its havoc has been greater than it ever has been in Michigan because of the very large orchards and the neglect of the disease. I saw acres upon acres of orchard in which more than every other tree was plainly diseased, many of them in the last stages. And it is almost impossible in many sections of Kent county, Maryland, to find an orchard free from it. It has swept the country as a mighty scourge and has everywhere left despair of renewing the conflict.

Into this beautiful region, swept with the besom of destruction, the national department of agriculture has sent a faithful investigator, Erwin F. Smith. Dr. Smith is a Michigan man, a person of long training and careful powers of observation. He has entered upon the investigation of the disease with great calmness and patience. He is working hard and to a purpose, and I have great faith that he will eventually give us a clue to the cause of the disease. He has extended his observations into Georgia, Kansas, and Michigan, and he expects to follow the disease wherever it goes. Everywhere he is making the most careful studies and he has already settled many disputed points. Much of his work is tentative as yet, and I am not authorized to speak of it.

To me the most important conclusion which he has yet reached is the fact that heavy fertilizing of any and all kinds has nothing more than an incidental effect upon the disease. Perhaps I should not speak of this fact as his conclusion; in answer to my question he only said, "Go and see." There are 100 fertilizer tests now under way, comprising forty acres in twelve orchards in Delaware and Maryland. There is an equal area under observation and control as a check. Every combination of fertilizers which has ever been suggested for yellows is under trial, and the effects of many special elements and substances have been investigated. In these trials I saw the most marked effect upon color, vigor, and size of tree, but none upon yellows. The disease appears equally in poor, rich, and specially fertilized soils of all conditions, and it spreads equally in all. I am sure that these field experiments, when the results are published, will show conclusively, what Michigan growers have always contended, that yellows is not caused by condition of soil nor by methods of treatment.

In his studies of yellows Dr. Smith has discovered another enemy of the peach, the work of which has been compounded with yellows and which has no doubt greatly complicated our knowledge of the disease. This is the peach root-louse, a black aphid which, during part of its life, works upon the roots. It checks growth, causing the tree to remain small and yellow, while its neighbors may grow luxuriantly. This insect is a very serious fact in Delaware and Maryland, and it has been found in Michigan. Tobacco worked into the soil is found to destroy it, but it is not yet determined if this remedy is cheap enough to warrant its general use.

Any one familiar with the Michigan yellows law can find indisputable proof of its value by visiting the stricken peach orchards of the Chesapeake country.

THE ANNUAL ELECTION.

The hour having arrived for the annual election of officers, Mr. SCOTT moved that the secretary be instructed to cast the ballot of the society for Mr. T. T. LYON for re-election as president. This was seconded and unanimously carried by a rising vote.

Messrs. COOK and STEARNS were appointed tellers and a ballot taken for election of secretary, the result being seventeen votes for EDWY C. REID and four for CHAS. W. GARFIELD.

For treasurer, Mr. S. M. PEARSALL was elected, receiving twenty-three votes.

Mr. ROLAND MORRILL was elected to succeed himself as a member of the executive board, receiving eighteen votes to six cast for Mr. J. N. STEARNS. Mr. E. H. SCOTT declined re-election, making remarks appreciative of the society and declaring his unabated interest in it. Mr. C. J. MONROE was chosen Mr. SCOTT's successor, receiving twenty-three votes to three cast for L. B. RICE and one for J. N. STEARNS.

The committee appointed to examine the reports of the treasurer and secretary reported as follows:

KALAMAZOO, MICH., Dec. 3, 1890.

To the President and Members of the State Horticultural Society:

Your committee, to whom was referred the reports of the secretary and treasurer, respectfully report that they examined and compared the books of the said secretary and treasurer with their respective vouchers, showing as follows:

Balance on hand Dec. 2, 1889.....	\$42 96
Received from all sources to Dec. 2, 1890.....	405 00
Making	<hr/> \$447 96
Total disbursements to Dec. 2, 1890.....	194 31
Leaving in the hands of the treasurer Dec. 2, 1890.....	<hr/> \$253 65

The committee find that there are 205 life memberships, making due that fund at this date \$2,050, invested as follows:

Seymour Mortgage.....	\$1000 00
Littell ".....	300 00
Snell ".....	300 00
Cook ".....	350 00
Two U. S. 4 per cent bonds, \$50 each.....	100 00
Making the.....	<hr/> \$2,050 00

The above mortgages were exhibited to the committee, showing that the interest has been indorsed for each year and that there is no interest past due.

C. J. MONROE,
A. C. GLIDDEN,
Committee.

Afternoon Session.

The session was opened by Prof. L. R. TAFT, of Michigan Agricultural College, with a paper upon

EXPERIMENT WORK OF 1890.

In the original act of congress under which the agricultural colleges of this and other states were endowed, we find no mention of experiments as a portion of their work; but if we read in the Congressional Record the debates on the act, we shall find that the advocates of the measure expected the colleges to give some attention to experiments.

The state board of agriculture, to whose charge the Michigan Agricultural college was entrusted, held similar views, and almost from the very beginning they arranged for various experiments by the different departments. The results were published in the reports of the board, and have been of great value to the farming community.

Some six years ago the state legislature passed a bill authorizing the publication, by six of the departments of the college, of at least two bulletins each year, to be distributed to the press and the farmers of the state. Under this arrangement some seventy bulletins have been issued.

In the spring of 1888, congress passed what was known as the Hatch bill, which gave to each state and territory \$15,000 annually, for the establishment of experiment stations in connection with the Agricultural colleges. As soon as the money was available, the trustees of the college at Lansing organized the station with six departments. The president of the college was appointed director, and with the heads of the departments constituted the station council. The departments referred to were agriculture, horticulture, chemistry, botany, entomology, and veterinary.

The work undertaken by the horticultural department, while the great principles that underlie the art have not been forgotten, has dealt largely with the practical questions that suggest themselves to the mind of every thinking person, and the result of which will be most likely to be appreciated by the average horticulturist.

Among the simple things we are noting with interest, are the value of different stocks for apples, pears, and plums; the effect of whole-root against piece-root grafting; the results obtained from using trees one, two, or three years old for orchard planting; whether, as is often thought, trees will not succeed when old trees have been taken out; the effect on an orchard of constant tillage, as compared with keeping it in sod and furnishing food in the form of ashes and stable manure.

Considerable attention has been devoted to testing, in a comparative manner, the promising new fruits. Until lately the department has lacked land for extending its orchards, but we have now been assigned some fourteen acres well adapted to the purpose. Last spring we planted on this piece some three hundred varieties of apple, fifty each of pear and cherry, forty of peach, thirty of plum, and forty of grape. Many of the trees were grown in the college nursery and others were obtained from reliable parties.

In order to have a reliable test of the varieties, four trees of each were as a rule obtained and were planted one rod apart each way. They can grow at this distance for a number of years, and will have borne enough for a thorough test before crowding. The apples were planted in squares,

with the idea, eventually, of taking out three of every four, leaving them with one tree of each variety and two rods apart.

With our cherry trees we had a very conclusive answer to one of our questions noted above. In ordering trees we were careful to specify two-year-old trees, and in most cases such were received. In one case, however, we received trees three if not four years old, and in another they were only one year old and small at that. The large trees were an inch and a half in diameter, with short stumps of roots and long bare trunks. They were planted carefully and received the same attention as the three-year-old trees, and yet we lost fifty per cent. of the large trees and not one of the others. The one-year trees were mere "sprouts" and we set them out in nursery rows where they received the same attention as the large trees. Every one lived and made a good growth. These results coincide with our previous experience, and until we have other light on the subject we shall advise the planting of trees not over two years old.

With peaches they should never be more than two years from the bud, and even for the ordinary planter well-grown pear, plum, and cherry trees of certain varieties of one year, will bear fruit as soon as older trees, and will be much more satisfactory. For the practical fruitgrower, who knows how to form the head of his trees, the best results will be obtained from one-year-old trees of nearly all kinds, to be placed for a year, if thought best, in nursery rows.

In caring for young orchards we find it best to plant the land between the trees with such crops as require frequent cultivation up to the first of August, and that can be harvested without disturbing the soil. The crop which seems almost an ideal one to us is winter squashes. With trees one rod apart, we place a row of squash hills between the rows of trees, and a single hill in line with the tree row. Field beans also make a good orchard crop, and in young orchards we have grown early sweet corn, taking care to have no hill within four feet of the tree. In a low, imperfectly drained spot, we have planted a number of Russian apples to give their hardiness a thorough test. We have also, in more favorable locations, some of the more promising Russian apples, pears, plums, and cherries of the importations of Prof. Budd of the Iowa Agricultural College.

The question of fruits for the northern portion of the state is an important one and it may be noted here that in an attempt to solve the problem we have placed with three reliable parties in the Upper Peninsula, a collection of varieties that succeed in the cold northwest. We have also, at Grayling, Crawford county, on the station land, an orchard of 300 trees set the past spring. The soil is light and porous, the winters are long and cold, and the summers hot and dry. The varieties selected are such as thrive under precisely similar conditions in western Siberia. Smaller collections have been entrusted to farmers in the neighboring counties, one of whom reports that his trees made a good growth during 1888 and passed the winter without loss, while his neighbor who had purchased "ironclad" varieties from the tree agents lost every one from winter-killing. This teaches, at least, that knowledge of varieties is necessary before success with orchard fruits can be obtained in that section. This knowledge we are endeavoring to supply.

The department, as practice work for the students, grows in the nursery several thousand fruit trees. Most of them are of such new sorts as we are able to secure scions of, and we have made a practice of distributing

for trial, in various parts of the state, such plants as we may have to spare. Thus we hope to secure information as to their adaptation to the various sections, and we are also able to place the new and promising sorts in the hands of persons who will appreciate them. In the small-fruit garden we are testing over one hundred varieties of strawberry, besides raspberry, blackberry, currant, gooseberry, etc.

Of the strawberries, we intend to plant twenty-four of each variety. Half of the plants are kept in hills and the others are allowed to spread in matted rows. Our notes for the past season show the Pearle to have been most productive, while the Haverland nearly equaled it. These varieties are rather soft for shipment, but for local markets they are well worthy of trial. The Lady Rusk is nothing more than a very firm Crescent and as such is of course valuable. The D. and D., from Barnesville, O., was planted last spring, and gives indication also of being of Crescent parentage. Of other valuable new sorts are Daisy, Eureka, and Parker Earle. The Bubach, Warfield, Gandy, Jessie, and Lida also made a good showing.

We have no new raspberries that we can recommend above the standard sorts, although the Royal Church, of the reds, and Cromwell, of the blacks, are promising.

SUB-STATION AT SOUTH HAVEN.

Fruits grown on our grounds are subjected to rather severe tests, owing to the unfavorable soil and climate, and, as many tender sorts that are valuable in other sections utterly fail at the college, the board, in the spring of 1889, authorized an arrangement with President LYON by which a report on the fruits grown in his extensive experimental plantation at South Haven was secured. This was published as Bulletin 55, and met with such favor that it was thought best to establish a permanent sub-station on the "Lake Shore." To secure its location at that point, the people of South Haven bought and donated to the station five acres of land adjoining the Lyon tract, and the services of President LYON were secured to take charge of the sub-station.

Planting was begun in the spring and will be continued from year to year as new and promising varieties can be secured. In the meantime we have the use, for station purposes, of the trees and plants belonging to President LYON. Many of these have been planted four years and will furnish results long before they can be obtained on the station property.

President LYON has during the season taken careful notes and the public is referred to Bulletin 67 for his conclusions.

In all cases we endeavor to obtain the new seedlings before they are placed on the market, and the intelligent, reading public can, by studying the bulletins, save thousands of dollars by refusing to purchase the high-priced novelties that have been tested by the station and found less valuable than the old standard sorts.

Nine tenths of the failures in fruitgrowing are due to improper soil, a poor selection of varieties, or lack of proper care and cultivation, and these could have been avoided had the owners taken pains to post themselves as to the best methods and varieties, and then put in practice what they had learned.

TESTS OF VEGETABLES.

We have also endeavored to test all the promising novelties in vegetables. The first season they are given a preliminary test on a small scale, using from twelve to 100 plants of each variety, and on the following year the more promising sorts are grown on a larger scale, that we may have more reliable knowledge of their value under field culture. Particular attention has been given to the varieties and methods of planting of potatoes, tomatoes, peas, cabbage, lettuce, and radishes, besides which we grow large collections of beans, sweet corn, beets, onions, peppers, various cucurbits, etc.

Very few of the novelties of 1890 are more valuable than the sorts previously introduced. Many of them were old sorts renamed, and the strains showed no better selection than the original varieties. To sell such seed at prices from three to five times as high as was asked for larger packages of the same seed under its real name, was nothing less than fraud.

Of our potatoes, the Summit and White Elephant were most productive of the late sorts, and Lee's Favorite and Timpe's No. 4 of the early kinds. For two years our results have been in favor of a liberal amount of "seed" for potatoes. In 1889 the best results were secured from halves of medium-size tubers, and practically the same conclusions were derived from this year's results, although, as the crop was nearly a failure, we place less dependence upon them.

An interesting experiment tried this year consists in planting pieces varying in size from single eyes to whole large tubers, at distances ranging from one to three feet. We obtained the best results from single eyes at a distance of one foot, and from whole tubers at about two and one half feet. The largest net yield was obtained from the use of pieces weighing from two and one half to three ounces, at a distance of one and one half feet, or about twenty bushels of seed per acre. For two years we have obtained as good results from the use of seed ends of potatoes, as from the stem or middle cuts. In our tests as to the best depth to cover potatoes, one or two inches have furnished better results than were secured at three, four, or five inches. This might be changed, however, in a dry spring and on light soil.

As with trees, our practice has been to distribute our surplus seeds of new vegetables, and very satisfactory results have been secured.

Considerable attention has been given to the origination of new varieties, both by selection and crossing, and we are now testing a large number of seedling strawberries, raspberries, currants, besides potatoes and other vegetables.

The only variety that has been distributed and placed on the market is the Ignotum tomato, a single plant of which was found in 1887 by Prof. BAILEY in a German variety, and by careful selection for three years its type has been so far fixed as to make it the best of all tomatoes.

WORK WITH FERTILIZERS.

Our work with fertilizers has been confined to testing the effect of various chemicals on the growth, earliness, productiveness, and quality of various fruits and vegetables.

We are more than ever impressed with the value of unleached wood

ashes as a fertilizer for all kinds of vegetables and fruits. They can generally be obtained at little or no expense, and an application of 100 to 200 bushels per acre will often increase the yield from 50 to 100 per cent. For vegetables, in particular, well decomposed stable manure can hardly be used to excess, and in intensive gardening forty two-horse loads per acre can be applied with profit. When stable manure and wood ashes can be obtained at the prices current in most sections of the state, we do not believe that commercial fertilizers can be used as manures with profit, except in special cases. For early vegetables a small quantity of nitrate of soda can be applied with profit. It is a soluble salt and will furnish nitrogen to the plants until they are able to procure it from the soil. The hotbed and greenhouse soil, and for certain crops when there is a lack of phosphoric acid in the soil, ground bone or dissolved bone-black may be used. When fertilizers are to be furnished as complete manures, although the want of the plant should be considered, there can be no rational system of manuring that does not take into account the constituents of the soil that are available as plant food.

AS TO FUNGI.

For several years we have given considerable time to a study of the life histories and the testing of remedies for the destruction of the fungi affecting our fruits and vegetables. In 1889 some six fungicides were tested as remedies for the apple scab, and all were found more or less effective. The best results were secured from the use of the modified eau celeste, with carbonate of copper a good second. The fruits on two large trees were examined, and eighty-eight per cent. were more or less affected with scab, while on the trees sprayed five times with modified eau celeste only twelve per cent. were affected, and the scab was much less injurious on these fruits than on the average of the affected fruits from the unsprayed trees. It was noticed that the average weight of the scabby fruits was ten per cent. less than that of those free from scab, and that a similar difference existed between the weight of the smooth fruits on the unsprayed trees as compared with those on the sprayed trees.

It seems probable that a portion at least of this should be attributed to the injury of the scab fungus to the foliage of the unsprayed trees.

Experiments thus far conducted show that wherever spraying is feasible nearly all fungi can be destroyed, provided the application is before the mycelium of the fungus has penetrated the epidermis of the plant. To be effectual, it is necessary to repeat the application at frequent intervals.

EXPERIMENTAL FORCING-HOUSES.

The fall and winter months were fully occupied in the construction and care of two experimental forcing-houses. We made use of various methods of building, glazing, heating, and ventilating, and as a part of the experiment introduced several features that, so far as we know, had never been used in greenhouse construction. One house was heated by steam and the other with hot water. The heaters were alike so far as grate and heating surface was concerned, and the radiating surface was properly adjusted in the houses. After a trial of five months it was evident that equal efficiency could be obtained from hot water with an expenditure for fuel of from twenty to twenty-five per cent. less than was required in the steam heater.

The results were printed in Bulletin 63 and, although reprinted in a large number of papers, the call for the bulletin has been very large.

The results for this year with vegetables, fruits, and greenhouse, will soon be issued, and any member of this society can have the bulletins of the horticultural as well as of other departments of the station sent free to his address, by furnishing it to the secretary of the society or to the secretary of the station at Agricultural College postoffice, Michigan.

The work of this department is for the benefit of the horticulturists of the state, and their co-operation and support has been of great assistance to us. We are always glad to receive suggestions, and if any one has any experiments in mind that would be likely to result in good to the general public, he should not be backward in making them known.

TEST YOUR FERTILIZERS.

Mr. MORRILL: Prof. TAFT says good results were obtained from commercial fertilizers on land of moderate fertility. I would like to know what he used and if he used it early in the season.

Prof. TAFT: Sulphate of potash was used on early vegetables with good results. In the houses, ground bone and bone-black did the same. Outside, both of these and sulphate and muriate of potash gave good results. I do not like to advise the use of the so-called commercial fertilizers until after a test upon a small scale upon several varieties of plants and comparison with unfertilized plats.

STANDARD OR DWARF PEARS.

Prof. TAFT was asked which he would recommend for planting, standard pears or dwarf, and replied: For the ordinary grower (ordinary methods of culture) the standards—they will live longer and bear longer; yet, on certain soils and with superior care, the dwarfs succeed best and are less subject to blight.

WHAT EXPERIMENTS ARE NEEDED?

Following the reading of Prof. TAFT's paper was the one given below, by Mr. C. ENGLE of Paw Paw, on

WHAT EXPERIMENTS DO FRUITGROWERS DESIRE?

If the question had been put, "What experiments do fruitgrowers not desire?" I think this paper would have been very short. Take the orchard, vineyard, or berry-field, as they are now managed, and anyone with never so small an amount of observation will readily see the wide difference in their management in almost every part of the work, from the time of setting until and after the fall maturity of the plants. One sets his trees as much as six inches deeper than they grew in the nursery, and I have seen it advocated to set even eight inches deeper. Another sets as nearly as may be the same depth as they grew before taking up, and others all the way between the two extremes. It seems to me that a series of experiments made at our stations might permanently settle this question, whether deep, medium, or shallow planting produces the best results.

The matter of pruning is another thing I would like to see experimented

with thoroughly. Whether, in the grape, the long spur or renewal, or the Kniffen system, for we seem to have settled down to these two, produce the best results. Which system gives the greater amount of grapes, the largest bunches, and better quality, and still keeps the vine vigorous and healthy?

Many fruitgrowers advocate thinning out the tops of peach trees to let in the sun and light. Downing describes a system of shortening in by going over the whole tree and cutting back the new growth from one half to two thirds, which has the effect of greatly increasing the density of the head or top. Can we get as much or more fruit, and of equal or better quality, by the one way or the other?

There seems to be a general belief, with a few exceptions, among grape-growers, that nitrogenous fertilizers can not be used in the vineyard without spoiling the quality of the grapes. I have tried but one experiment in this direction. Desiring to push a new seedling, which I thought of very good quality, it was manured heavily from the barnyard. That was six years ago, and I have never thought it was even a good grape since. The Delawares in an adjoining row seem also to have lost much of their sprightliness and fine flavor. Since then I have used some form of potash, mostly unleached ashes, for the vineyard. I might have been mistaken in the first place in the quality of the grape. It seems to me our stations might settle this question for us permanently. The greatest difficulty in the way is the extreme length which the roots of the grape attain. I have traced them sixty feet from the crown and found them as thick through as my finger at that distance, and the Lord only knows how much further they went! By experimenting with vines long distances apart, I think some certain result might be determined.

Raising certain kinds of fruit from the seed, to determine which varieties, if any, it would be safe to set for permanent bearing, is another work I would like to see our station undertake. I am the more interested in this work from having experimented quite a little in this direction myself. A number of years ago I recollect reading the experience of one man in raising peaches from Early Crawford pits. As stated, he raised some fifty trees and planted them in orchard form, not one of which produced a good peach. All were poor. This is directly at variance with my experience. Having raised and planted some thousands of this variety, I have yet to see a really poor peach grown from Early Crawford pit; and, with very few exceptions, I can say the same for Crawford's Late, Barnard, and Hill's Chili. Smock and Salway produce peaches resembling very closely their parents outwardly, but as much as seventy-five per cent. are clings. It seems to me, if our station or stations would take up this matter, they might in the end confer incalculable benefits upon the fruitgrowers.

It will take a long time, years, to fully settle many of the questions herein mentioned, but in the end we should have certainty where now it is all uncertainty.

As it now is, the beginner in fruit culture, and I might include most of the older ones, does not really know what he should do. He sees an article in some of our horticultural periodicals, and it looks sensible, and he thinks he has got it all right. In the very next issue, perhaps, the whole thing will be contradicted, so he is left stranded.

What we desire is facts, backed up with authority. Our stations can, and I think will, furnish us both

I might go on through every phase of the work in fruitgrowing and find plenty of questions requiring experimental work to settle. The ones indicated have occurred to me as being the most important, as well as the most difficult to settle. I hope to live long enough to see their solution undertaken by our stations.

At conclusion of the above the secretary read the subjoined paper by Z. J. Davis of Jackson:

WHAT EXPERIMENTS ARE NEEDED BY THE GARDENERS?

As this society has been kind enough to allow me to monopolize some of its valuable time and attention, with a statement of "What experiments are needed by the gardeners?" I would say that the gardeners of this community would be very thankful should the society deem it worth the time and labor that it would cost for any information which might be gained by experiments—

First, to lessen the cost of production, either by a proper knowledge of the use of fertilizers, care of the soil, mode of culture, or by methods to combat successfully against the attacks of insects and diseases injurious to the garden;

Second, to improve any variety of vegetable;

Third, for any improvements in the ways of preserving vegetables through the winter.

Under the first heading, the needs which are most keenly felt in this vicinity, by the gardeners, are ways to exterminate cut-worms; yellow-striped bugs found on cucumber and squash vines when the vines are quite young; a large brown bug having a peculiar odor, which attacks the roots, leaves, and fruit of the squash vine; maggots, which infest the roots of early cabbage, and cabbage worms; also, the cause of and remedy for the disease in the roots of the squash, melon, and cucumber vines, proving the most fatal to squash, both summer and winter. In this case the vines may present a thriving and healthy appearance until thus attacked, when they suddenly wilt and die, which generally occurs about the time the fruit begins to set. Another disease which seems to baffle all efforts to eradicate is the tomato rot.

In regard to heading number two, it is a fact too widely known to require the assertion that, so long as time lasts, experiments for the purpose of perfecting all known varieties of vegetable, and originating new ones, will ever be of the greatest value to the gardener.

It is an old and true adage that "a penny saved is two earned." Therefore the question arises, how can we save our pennies any more effectually than by saving our vegetables through the winter, so that we may derive the benefit of a good market; but, to accomplish this successfully, experience and experiments must teach us much now unknown, especially in regard to the preservation of cabbage, onions, and celery.

VARIOUS QUESTIONS ABOUT PEACHES.

Mr. MORRILL (to Mr. ENGLE): Do you shorten-in all peach limbs? When all limbs are so treated do they not send out many new shoots, making the top too heavy and thick? Is it not better to shorten only the longer limbs?

Mr. ENGLE: I have always practiced shortening the longer ones only, but I do not shorten until I know the trees are going to bear fruit; then I remove some entirely, shortening others. Nor do I cut back at all until the trees are four years old.

Mr. A. B. COPLE: I would rather have Crawford, Barnard, or Hill's Chili seedlings than a lot of trees budded from the same varieties. If any such trees are broken when they mature, the same fruit comes from the sprout following the break; and I believe such seedlings to be more vital and hardy. The Gregg raspberry will reproduce itself very closely, from seed, in quality and appearance, with some variation in ripening.

Mr. L. H. STODDARD: Which is better: To let peach trees sway in fall and winter winds, and stand the resulting damage, or to fall prune, with the injury believed to come from that practice?

Mr. ENGLE: I have cut back in the fall, at times, without perceptible damage.

Mr. BARTHOLOMEW: Which would Mr. ENGLE prefer, in planting for seedlings, pits from separate trees or from trees in a block of the variety?

Mr. ENGLE: From a block and from the center of it.

Mr. PEARSALL: I raised peaches from pits, at an early day, and often got very fine fruit, but I would not recommend the practice.

Mr. HAWLEY: To prevent injury from the swaying of trees I would crowd earth up about them and even stake them if necessary.

THE TREE CUTWORM.

Mr. RICE asked what was good for the tree cutworm.

Mr. MORRILL: Buckwheat plowed under when in bloom is good for one year. Bands of wool placed about the tree prevent the worms from crawling up. They are superior to cotton batting, because the latter packs and after a few days the worms walk over it. Sheep's wool will stay loose, affording no foothold. The rot which was so prevalent in tomatoes last season was due to a check of some sort in growth—cold, drouth, or some such cause—after formation of the first fruits. This is the sum of observations at Benton Harbor. A Niles grower has very successfully met this difficulty by laying lines of tile from a ditch across his tomato plat, by which he irrigates at any time he chooses.

Mr. HAWLEY: These cutworms may be picked up in the day time. I have captured as many as 100 about one tree. Buckwheat is sure death to them, and some worms may be kept off by use of strips of tin about the trunks. They can not crawl over wool, but they will sometimes crawl under it and eat the bark. In gardens they may be poisoned by pieces of turnip or potato laid about, having Paris green sprinkled upon them.

Mr. MORRILL: Plow the ground just before setting tomato plants, and the worms will go elsewhere in search of food. Poisoned leaves of dock are effectual against them.

Prof. COOK: I can scarcely agree to the theory that they may be starved out. They will travel a considerable distance, and hence no small piece of ground can be made wholly free of them by plowing. But in the last few years we have been very successful in poisoning them, using clover, leaves of mullein, dock, etc. Some practice throwing such leaves about in bundles. I found as many as twenty worms under one bundle, but some of these poisoned probably do not die before crawling back into the ground. The solution for this purpose may be very weak, say one pound

to 200 gallons. Sprinkle the leaves with this, drive through the field and scatter in bundles. The worms travel rods, sometimes in quest of food or for other reasons, but the moth will not lay eggs where there is no herbage. The past season was the worst ever known for cutworms. The mild winter caused an unusual supply, and of saw-flies also, the pupæ passing the winter better than if it had been severe.

W. W. TRACY: Cutworms were excessively thick upon Mr. Ferry's farm at Pontiac. We lost fifty tomato plants in two nights; yet, by poisoned clover, we saved the plants on two acres of the same ground except, perhaps, one half of one per cent. We placed the clover bundles a rod apart and found as many as thirty worms under a single bunch. The cutworm which attacks fruit trees is of a different species from the one which eats the corn and vegetables. They go to the fruit trees and vines because they have to—for want of other food—but originally they did not do so.

POINTS IN VEGETABLES.

Concluding the afternoon session, Prof. W. W. TRACY, superintendent of D. M. Ferry & Co.'s seed farms and testing grounds, discoursed upon "Points of merit in vegetables," illustrating his remarks by figures drawn upon paper. He said:

QUALITY IN GARDEN VEGETABLES.

I want to ask your attention for a few moments to the consideration of desirable qualities in some of our common garden vegetables, speaking of each as a whole rather than of any particular variety. Possibly this may seem unnecessary. Most of you think you know beans, at least well enough to tell good from bad, and all of you recognize the superiority of vegetables as brought to your table by your wife or mother; but would it not be worth while to give a little thought to those external indications which enable one, who can read them, to recognize a good vegetable without a cooking test? And this is what I ask you to do with me this afternoon; and first let us look at

ASPARAGUS.

There has been a good deal of discussion as to whether this vegetable should be blanched or green, some claiming that blanched shoots only are really fit to eat, and refer for proof to the long, tender, and delicious shoots served up in France, where only blanched asparagus is used. Others say the brown or blanched portion is always tough, woody, and flavorless, and only the green portion should be used; that we must never cut or break below the surface. We think a little consideration of how the plant grows will disclose the cause of this difference of opinion. The young shoots of asparagus expand and elongate very fast at first, but with gradually decreasing rapidity. The hardening or development of woody fibre commences at the base of the shoot and extends upward, slowly at first, but with gradually increasing rapidity until it overtakes the elongating point about the time it breaks into branches, and the entire shoot becomes hard and unedible.

An asparagus shoot, or bud before it becomes a shoot, is woody at the point of juncture with the collar from the first, so that if we cut it at the

collar when it is never so small the lower part will be woody and tough and we shall have to cut it at a proportionately greater distance from the collar, as the shoot elongates, to avoid this woody portion; so that, if we plant shallow and cut much below the surface, we shall always have woody butts, and to avoid them we cut above ground and have green and tender shoots. If, however, we plant deeply or, better still, follow the French method and plant shallow and thin, during the cutting season, banking up over the plants with light, friable soil, or other suitable blanching material, we may have long, perfectly blanched shoots but far enough from the collar to ensure tender blanched asparagus without woody butts. The secret is, cut your shoots at a distance from the roots proportionate to their age.

BEANS.

I will only speak of them as used for snaps. Since the general introduction of the wax-podded sorts, people have come to judge of this vegetable almost entirely by its appearance, the longest, whitest, handsomest pods being considered the best; but a better observation will show one that the whitest pods in the basket are by no means the whitest when cooked. If we will cook the clear white pods of the Ivory Pod and the yellow ones of the Golden Wax, we will find the latter much the lighter and brighter color; and if we go further and taste them there will be no doubt as to which is the better quality. The value of a snap bean rests in its fleshy pod, and in judging of the merits of different lots we should not only look at the external shape and color, but at the flesh. This should completely fill the pod so that there is little depression between the beans, and on cutting the pod at these points there should be no cavity seen. The flesh, too, should be firm and solid. In some sorts it is very juicy, and even watery, when the pod is young, but speedily becomes spongy or pithy. Last, but by no means least, the pod should be, as the Europeans say, "free from parchment"—that is, the inner lining of the pod should be thin and without fiber, a point which is often overlooked, the observer being satisfied if there is no "string" at the back.

BEETS.

Most people are content if the root is smooth, shapely, and of good color, but this is by no means all. The color should be one that will hold while cooking—should be "fast;" and second, the top should be small and compact, covering and occupying as small a proportion of the top as possible, because it will always be found that the portion just below the top is harder, rank-flavored, and lacking in sugar. This is so universally invariably true that the French and German sugarmakers always cut off and throw away this portion, often amounting from three to five per cent. of the root, saying they can not make good sugar when this part is taken.

CABBAGE.

In a long and large-stemmed plant we will find the leaves relatively far apart and with large, coarse midribs; and as a portion of the stem extends up into and becomes the objectionable core of the head, it carries with it the same character, and we have a large-cored and soft-hearted head, the base of the leaves being separated in the head in the same way as below it.

Again, the shape of the leaf is important. A fault often seen is the blade not extending to the very base, thus giving the leaf a distinct stem. The leaves of the head will be of the same character, and consequently the heart, made up of the bases of the leaves, will be loose and "stemmy" at the center, even if hard and firm at the outside. The leaves should also be abundant in number, long, and show a decided tendency either to inclose the center or to be dish-shape. If not, we have a head in which the leaves do not lap by each other, forming one with either an opening or soft spot down through the center, through which the seed-stalk will soon push its way and the head become worthless. Lastly, the leaves of all cabbages should be thick and brittle rather than thin and fibrous.

CAULIFLOWER.

The common opinion is that cauliflower heads should be smooth and flat; but Long Island gardeners, who have given more attention to this vegetable than any one else in this country, declare that the head should be round rather than flat, and as knobby as possible. They claim, and we think with good reason, that the flat umbel-shaped head must of necessity have a much larger proportion of stem than one which is in general outline nearly globular, and in which each section is also globular, thus giving a rough or knobby, rather than a smooth head. Certainly the latter style are much heavier and more solid, and we think are of better quality.

CARROT.

Few people in this country know how palatable well-grown and properly cooked carrots are; but in order to fully appreciate them one must use the small and finer grained garden varieties, and when they are in proper condition, which is when they are young and tender, not waiting until they are nearly full-grown, as is commonly done.

CELERY.

Here, as in beans, too much weight has been given to whiteness, and flavorless and soft White Plume has ruled the market. It certainly is true that excessively blanched and white celery is always of inferior quality. Often it is actually worthless, being pithy and soft. Good quality is indicated by fine grain and solidity. A person should be able to snap a stem into three pieces by taking it in both hands and giving a quick jerk with each hand in opposite directions. The break should be square, showing brittle fibre, and as little "string" at the back as may be. The flesh should be firm, solid, and fine grained, and have a rich, nutty flavor. Such celery is rarely seen in market, because of the demand for the whiter and, to the novice, more attractive kinds; but no one knows better than the Kalamazoo growers how to produce it if it is called for.

CUCUMBER.

Whether for pickles or slicing, if triangular in general shape of cross-section, as most of them are, the sides should be concave outward, instead of convex, the latter shape always indicating a hard and often bitter strip along the center of each side where the seeds are attached. The fruit

should also be nearly the same size throughout its entire length, any depression or seedless neck being indicative of hardness and bitterness of flesh at that point. In pickling cucumbers, the color is a very important point. It should be as deep, and extend as uniformly over the fruit as possible. Contrary to the usual opinion, we do not think that coarse spines or prickles indicate crispness of flesh, as the most crisp and brittle sort we know of is the Parisian Pickling, in which the spines are exceedingly small.

LETTUCES

should be divided into two classes, according to the method of use. If to be served with oil or similar dressing, the leaf should be thick, brittle, and crisp, rather than tender, and should have a decided flavor, may even have, when first picked, a decided bitter taste, this disappearing when served. Most lettuces of this class form distinct heads, and the same suggestions as to the proper form of plant and leaf which were given in cabbage will apply here. In the second class, the lettuce is cut up with vinegar, sugar, etc., and here tenderness is the great consideration and outweighs all others. No bitterness is admissible, and as a rule there is but little flavor. It is a disadvantage for lettuces of this class to form a distinct cabbage-like head, as the thin, tender leaves lose all their crispness and beauty of color when crowded into a dense head. A cluster of large leaves is much more desirable.

TOMATO.

This is the queen of vegetables, and one in which there is as wide a difference between the good and the bad as between a "frost" pear of the hedge row and a well-grown Seckel. The ideal tomato may vary somewhat in shape. For myself I like them to be nearly round or apple-shaped, but others prefer that they be flattened, oval. Whatever the shape, there should be no deep corrugations or seams, the fruit being nearly smooth, although a slight depression along the line of natural division is not objectionable. The stem should always be relatively small and set in a very shallow basin. When the stem is large and set deeply into the fruit, it is accompanied by a large pithy core extending into the fruit and ruining it for slicing or for canning. The stem end of the fruit should be nearly flat or slightly rounded. When there are any marked projections here they will be sure to be imperfectly ripened at the time the rest of the fruit is in the best condition. As to color, tastes differ; but I have never yet found a tomato of the purple tint of the old Fiji, which was not of a sharp, hard, metallic-like acid, very much less pleasant than the mild, fruit-like acid of the true red or scarlet tomato; and I am quite certain that, were we to select ten of the best varieties, quality to rule, eight at least, and I believe more likely nine or all of them, would be found to be clear, bright red, with little trace of purple. Of the interior of the fruit, the general opinion as to what constitutes merit is certainly at fault. Most people only ask for a solid, seedless, pulpless flesh. Fortunately, the fruit is too good to develop any such worthless variety as is thus called for. If you will carefully examine a tomato you will find that the greatest amount, and by far the finest, flavor is found in the pulp surrounding the seed, and that the flesh surrounding the fruit next to the skin is quite

different, and greatly superior, to that in the interior divisions, which many people value as making a solid fruit. Often these interior divisions are made up of perfectly flavorless, hard, but corky tissue. This is the case in an exceedingly large-fruited sort which I have grown for several years for comparison, but have not considered worthy of a name or of general cultivation, although I am certain that this variety can be made to produce the largest fruit having the smallest proportionate weight of seed and the largest proportion of dry matter of any of the hundreds of sorts I have tried; and yet I have seen the Mikado recommended as the best variety, because it stood first of any the writer had tested in these respects. My ideal tomato, as far as interior is concerned, is one in which the outer circle of flesh next to the skin is very thick, the thicker the better; the interior divisions few and consequently comparatively large, and each completely filled with pulp. Seeds are of themselves a disadvantage, but as we never have pulp except surrounding seeds, we shall have to have a fair quantity of them in order to get the desired pulp. This pulp should be as thick as possible. We sometimes find fruit in which it is very thin, and in such cases it is usually quite acid. The pulp should be as thick or solid as may be, while the flesh, both of the outer circle and of the inner division, should be as soft and juicy as possible, thus making the fruit as nearly uniform in consistency as it can be made to grow. I would be as critical as to the flavor of the fruit as of that of a pear or apple, and insist that, to be good, it must have a distinct, fruit-like, subacid flavor. Lastly, the entire interior, except the seeds, should be in color as nearly like the deep, rich red of the outside as possible.

In what I have said I have referred to table qualities only. There are many other qualities, as of earliness, size, productiveness, keeping, ability to stand rough treatment, etc., all of which should be considered in making up our judgment of a variety. Often a sort which will be the best of any for one set of circumstances will be worthless under other conditions, and no one can say, "off hand," which is the best bean or tomato, any more than he can say which is the best apple or pear, or which of a hundred women would make the best wife. If by what I have said I have awakened a little interest, so that some of my hearers will in the future give a little more thought as to why they like this or that sort the best, and thus forward the formulating of a distinct ideal of what the best should be, I shall be satisfied.

SOME REMARKS.

Responding to questions, Mr. TRACY confirmed Mr. MORRILL'S claim, that rot of the tomato is caused by some check in its growth, either excess of cold, moisture, drouth, or even transplanting. Seeds from such fruits should not be saved. Full supply of humus in the soil would tend to prevent such conditions.

Mr. WILSON: My tomato plants suffered from drouth and the fruit rotted, while those of a neighbor, set beside a brook, were free from it.

Mr. TRACY: Sugar beets are simply sweet. They have not fine flavor and are not best for the table.

Mr. REID: The Scarlet Horn carrots should be more generally grown for the table. They are best while young, and are then a real delicacy.

Kale is another vegetable too little known. Its culture is simple, its growth strong, and, cooked as cabbage, its flavor is delicious.

Prof. TAFT: It is as good as cauliflower and more easily grown than cabbage.

Prof. TRACY: Swiss Chard is a vegetable which also has not the attention it deserves. There is no vegetable I like better. The beautiful, white leaf-stalks are the part eaten, and whether dressed like asparagus or put into pickle, it is very fine. Like all other vegetables, it should be put, for cooking, into hot and slightly salted water.

Prof. TRACY: Savoy cabbages are very superior in flavor to the other varieties. They are greatly preferred in the New York market, and have been much improved under American cultivation, both in size and flavor.

WATER LILIES IN LAWNS.

Mr. L. B. RICE of Port Huron told how he successfully grew water lilies last summer. Having secured from southern New Jersey roots of a dwarf white variety, he got some barrels, sawed them in two and filled them one third full of clay and muck, in which the lilies were planted and the tubs were filled with water. The lilies bloomed in four weeks and continued blossoming all summer. In August he made a pond 8x12 feet and three feet deep, with brick and scantling guard and cement sides and bottom. Clay and muck to a foot in depth were placed in this, and the lilies therein planted bloomed in September. He added roots of pink and blue water lilies, which did well but did not bloom that season.

Evening Session.

Prof. TAFT of Michigan Agricultural college, instructed and entertained the audience with the following lecture upon

WHAT IS A FUNGUS?

Before attempting to give a definite answer to the question, What is a fungus? we can wisely spend a few minutes in considering some of the more general characteristics of the various groups of these interesting and often destructive organisms.

In the past, owing in part, perhaps, to their size, which is often microscopic, little attention has been given them, even by botanists; and many horticulturists, whose crops have been destroyed by them, are not aware of their existence.

The fungi are among the lowest of what are known as cryptogamic plants. We generally think of plants as possessing such organs as roots,

stems, leaves, and as finally developing flowers and fruits. While the fungi have most of these, from their very nature others are lacking.

These cryptogams obtain their food from the tissues of other plants, or from animals, either alive or dead. When the food is procured from decaying matter, they are said to be *saprophytes*. In this group of plants are the moulds, puffballs and toadstools. Others draw their nourishment from the cells of living plants, and are known as *parasites*. Many fungi cannot be strictly classed with either group, as they attack weak but living organisms, and, having killed them, feed on the decaying substance.

These plants vary in size from such minute forms as can only be seen with a microscope with a magnifying power of three thousand diameters, to the giant mushrooms and puffballs. The differences in their structure and methods of reproduction are nearly as great.

As these plants take up their food from the cells of other plants, they have little or no need of roots. In some cases they absorb their nourishment through their body walls, and in others they develop short, sucker-like organs which penetrate the cells of their hosts, and there take up nutriment for the plant, from the juices of their hosts, thus serving as roots for the fungus.

From the fact that this food has already been transformed, by the leaves of the host plant, into organic compounds, the fungi themselves have no need of leaves; and Nature, ever frugal, has not provided such useless appendages.

While the great mass of our common plants bear flowers varying in size, and more or less conspicuous in color, the fungi, owing to the fact that their reproductive organs are very small and inconspicuous, were by the earlier botanists believed to be without flowers, and were known as cryptogams.

According to most of the old classifications, the fungi included such cellular cryptogams as contained no chlorophyl or green coloring matter, while the forms that contained chlorophyl were called *algæ*.

The plant body of the fungi consists of a minute, generally threadlike, cellular structure, which absorbs food, grows, and finally, having attained sufficient size and strength, reproduces itself by some one of its different methods.

The lowest fungi include what are commonly known as SLIME MOULDS (*Myxomycetes*.)

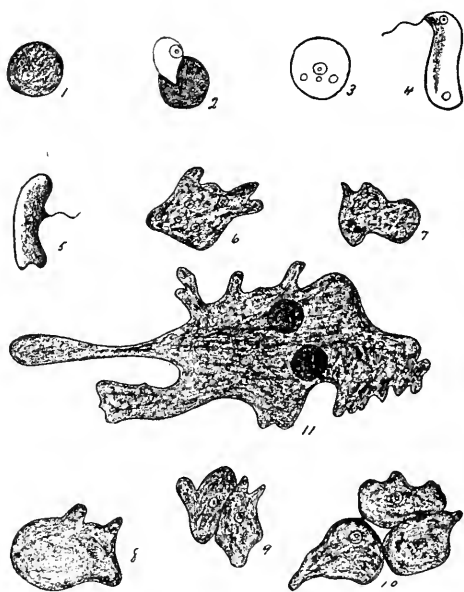


FIG. 1.—MYXOMYCETES.

1. Resting stage of spore.
2. Rupture of the spore case.
3. Ciliated zoospores.
- 4-5. Ciliated zoospores.
- 6-10. Amoeboid forms.
11. Plasmodium.—After De Bary.

It was formerly thought that all organisms possessing the power of motion, and especially of locomotion, were animals; but it is now known that many forms that are essentially, in structure, plants, possess this power, and no attention is now given to motion as a distinctive animal attribute.

The slime moulds (Fig. 1, ¹ to ¹¹) consist of cells, either single or joined together, forming large, jelly-like masses. During their growing period they have no cell walls, being a mere naked mass of protoplasm, and are without nuclei. When they have reached their growth they break up into smaller masses, each of which secretes a covering wall of cellulose for itself, and they then assume what is known as a resting stage. Any unfavorable surroundings, as a lack of moisture or a proper temperature, will cause the same behavior. When conditions become favorable they resume their former soft form; but, if

ready for reproduction before becoming encysted, the interior of the masses break up into a number of small bodies, each of which forms a cell wall. These are the spores, and if exposed to proper conditions of temperature and moisture they burst their coverings and take on a ciliated or amoeboid form.

In the former case they are provided with one or two hair-like appendages, and it is generally assumed when the amount of moisture is sufficient to enable them to swim.

In the amoeba-like form they often reach a considerable size and are able to crawl about.

These plants generally feed on decaying vegetable matter, and the only form known to be particularly injurious to the horticulturist is the one causing club-root in cabbages and turnips. Rapidly increasing by fission, the jelly-like mass swells the roots to many times their normal size, and not only robs them of their sustenance, but so checks the vital actions as to destroy the plants.

In England and on the continent, where club-root often occurs, they never grow turnips, cabbages, or other cruciferous crops on the land oftener than once in three years. The diseased roots are also gathered and burned.

BACTERIA.

Standing just above the slime-moulds in the vegetable kingdom, but bearing little or no resemblance to them, is a family of microscopic plants commonly known as bacteria. (Fig. 2.)

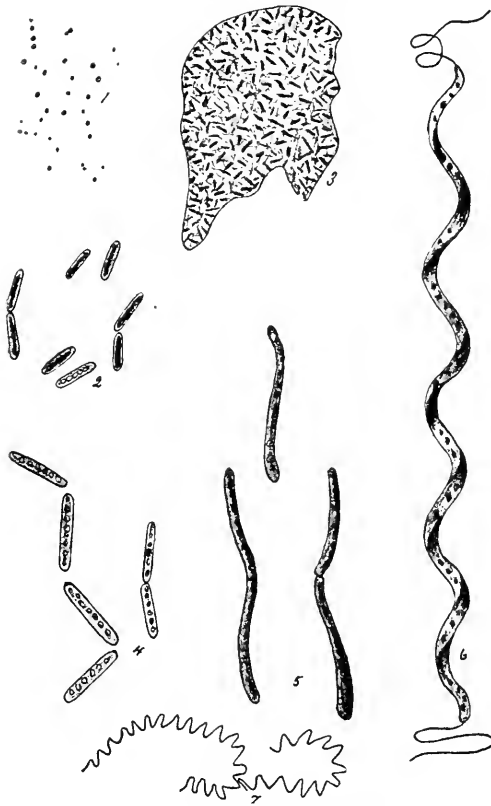


FIG. 2.—SCHIZOMYCETES OR BACTERIA.

1. Micrococcus.
2. Bacterium.
3. Bacterium, zoogloea stage.
4. Bacillus.
5. Vibrio.
6. Spirillum.
7. Spirochaete—After Cohn.

The microbes gain entrance to the tree through wounds in the bark, through the watery, unripened growth at the ends of the new shoots, and through the unprotected stigmas of the flowers. As preventives, avoid the use, for pears, of nitrogenous manures, or soils containing an excessive amount of organic matter; plant varieties that naturally grow slowly and whose wood is firm; train with low heads, and, so far as is possible, protect the trunk and branches from the burning rays of the sun. In dry seasons, especially if the trees are bearing full crops of fruit, secure for them by frequent shallow cultivation, or by mulching, an abundance of moisture, that the branches may not become dry and crack, thus affording access to the germs.

Of the other genera we have the bacterium (Fig. 2, ¹⁻²), with its straight, rod-like body, found in all putrefying bodies; the bacillus (Fig. 2, ⁴), the active agent in consumption, anthrax, cholera, and other diseases; the vibrio (Fig. 2, ⁵), differing from bacillus in having curved filaments; the comparatively large, coiled, and twisted Spirillum (Fig. 2, ⁶); and the finely-coiled Spirochaete (Fig. 2, ⁷).

They consist of single elongated or spherical cells, and increase in number by a process of transverse fission. The cells increase to about double their original size, the middle portion becomes constricted, and two cells are thus formed from one. In some instances they remain attached for periods of more or less extent, forming long slender threads. They can move about by means of slender filaments at each end of the body.

The bacteria are found in all decaying and fermenting substances. They are divided into four groups, according to their form. In the first we have those consisting of spherical cells. They are very minute and belong to the genus micrococcus. This organism in its various forms gives rise to many diseases to which mankind is subject, among them being diphtheria. Another form causes what is known as fireblight in our pears, and twig blight in apples, pears, and quinces.

So far as is now known, the only remedy is to remove and burn the affected portions, cutting at least a foot below where any sign of the disease can be seen.

Among the higher forms there are a vast number of fungi known as mildews, and from their appearance these are divided into "powdery" and "downy" forms:

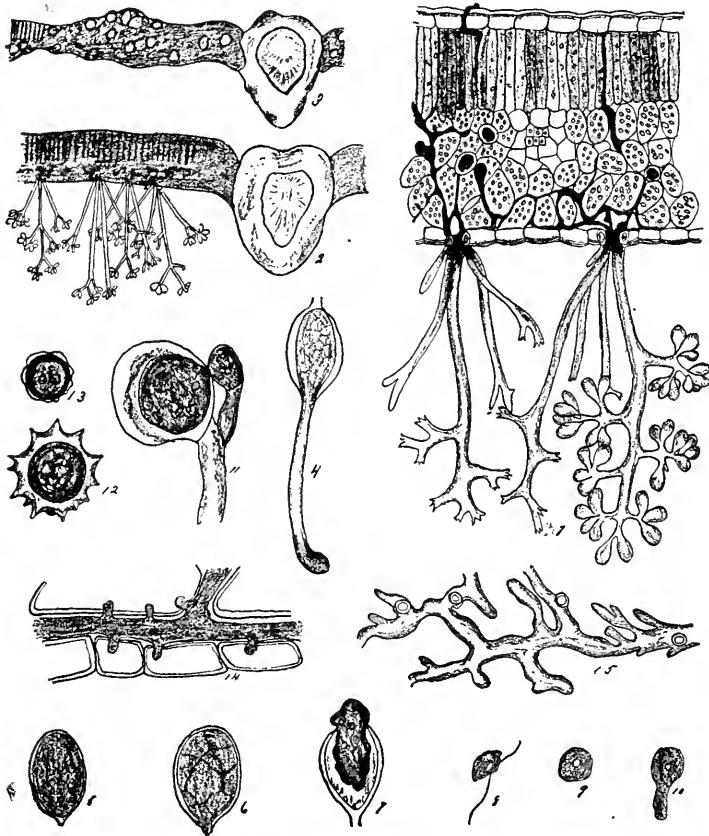


FIG. 3.—DOWNY MILDEW OF THE GRAPE. *Peronospora viticola*.

1. Section of leaf (greatly magnified) showing conidial stage.
2. Showing the same, less magnified.
3. The same, showing the effect of the fungus, the leaf brown and shrivelled.
4. Germinating conidia.
- 5-8. Development of conidia through zoospore and swarm-spore stages.
9. Spore.
10. Germinating spore.
- 11-13. Fertilization of organum and development of the oospore.
14. Section of leaf greatly magnified, showing mycelial thread passing between the cells, and sending its haustoria into them.
15. Branching mycelium, the spots representing haustoria.

—After Viala.

DOWNY MILDEWS (*Peronosporae*), FIG. 3.

The plants of this group live as parasites in the interior of other plants, and, without entering the cells themselves, they work their way between them, and penetrating the cell walls with their haustoria, or root-like appendages, they drain the cells of their substance and cause them to become brown, and finally dry.

The mycelium, or plant body of the fungus, consists of long branching filaments which ramify through the substance of their host, and, having

gained sufficient strength, send down through the stomata or breathing pores of the leaves, slender stalks (*hyphæ*), which bear, on the tips of their branches, oval bodies known as conidia or summer spores. These give the under side of the leaves a whitish, downy appearance, while the upper surface takes on a yellow and finally a brown color.

The spores soon drop off, and, if they fall on a moist place, germinate with great rapidity. The contents swell, become segmented, and finally burst forth as ciliated swarm-spores. They move about for a time, and then, having come to rest, they drop off their cilia and some throw out a mycelial thread which develops into a new fungus if the conditions are favorable. In this way the downy mildews rapidly reproduce themselves during the summer, generation following generation in quick succession. As winter approaches, the fungus sets about the development of spores, with thick coverings that will enable them to withstand the winter's extremes. These are developed at points where two threads cross or come in contact. Each thread gives rise to a rounded protuberance, one corresponding to the pistil and the other to the anthers of flowering plants. The contents of one passes into the other, and the development of the oogonium commences. It finally becomes covered with a thick cell wall, and at the proper time in the spring germinates, either by at once sending out a germ tube or segmenting and then pouring out its contents as ciliated zoospores, much like those developed from the conidia.

There is a long list of downy mildews, the most injurious, perhaps, being those of the grape and potato. They flourish in cool, moist seasons, and from their being endophytes, living in the tissues, are protected from applications of fungicides after the germ tubes have entered the stomata. For both of these forms, however, the Bordeaux mixture can be applied with good success. To be entirely effectual it should be repeated, especially in rainy seasons, as often as every two or three weeks. In the case of the grape mildew, the lime sticks to the fruit and some other copper mixture, as modified eau celeste, is preferable for the later applications.

POWDERY MILDEWS (*Perisporiaceæ.*) FIG. 4.

While the downy mildews flourish, as noted, in cold, wet seasons, the powdery forms luxuriate in seasons of drouth, so that, whatever the summer, the conditions will favor one or the other of these diseases.

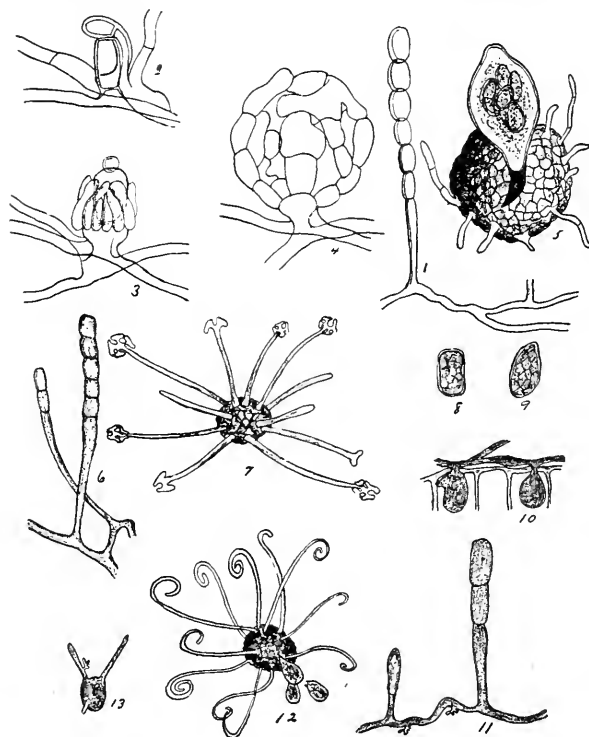


FIG. 4.—POWDERY MILDEWS OF ROSE, CHERRY, AND GRAPE.

1, summer spore of rose mildew; 2-4, development of carpogonium; 5, winter spore (perithecium) with ascus, containing ascospores escaping; 6, summer spores of cherry powdery mildew; 7, winter spore of same; 8, 9, mycelium with haustoria in cells; 10, mycelium with haustoria in cells; 11, 12, 13, the same, of the powdery mildew of the grape. —After De Bary.

formed in much the same manner as those of the downy mildews, but their structure is far more complex. After the fertilization of the carpogonium, finger-like processes are developed around it (Fig. 4,³), and becoming segmented (Fig. 4,⁴) they have a cellular or raspberry appearance. From the exterior, appendages of various forms are developed. In some cases they are straight, in others forked at the extremities, and in yet others are coiled as in the *Uncinula* of the grape (Fig. 4,¹²). Within these sporocarps or perithecia, one or more oval bodies (asci) are developed, and inside these are the ascospores, varying in number from two to eight. These winter spores remain in their cases on the fallen leaves until spring, when the asci burst the walls of the perithecium and the ascospores escape through orifices at the extremities of the asci. They soon germinate and the cycle is completed.

Living, as it does, entirely outside its host, this fungus is readily amenable to fungicides; sulphur or sulphur fumes are used with success, where the air is confined, and all of the copper mixtures are effectual.

In their structure, also, the powdery mildews are quite unlike the other form. The mycelium in the form of white, jointed filaments, spreads like a cobweb over the leaves and stems of the host plants, but the threads do not enter the tissues, the food being taken up from the underlying cells by minute haustoria (Fig. 4,^{10, 11, 13}) which penetrate the epidermis. This fungus is generally found on the upper surface of leaves.

Under favorable conditions the fungi wax and grow strong, and at length send up fruiting hyphæ (Fig. 4, ¹) on which the summer spores are produced by constriction. The one at the tip soon falls off and the others follow. If they fall on "good soil" they at once germinate and produce a new mycelium.

The winter spores are

THE RUSTS (*Uredineæ*), FIG. 5.

Perhaps no group of fungi are so little understood as the one to which our common wheat and oat rusts belong. Although the real nature of the disease was pointed out by Sir Joseph Banks, nearly one hundred years

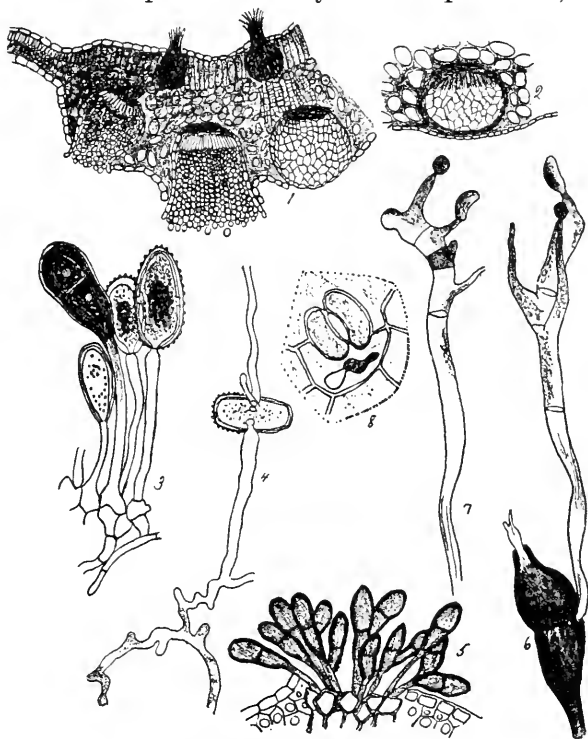


FIG. 5. *Puccinia graminis*. WHEAT RUST.

1, Section of barberry leaf, showing the ascidium fruits below and spermatogonia above; 2, unopened ascidium fruit; 3, three summer (uredo) spores and one teliospore; 4, germinating uredospore; 5, cluster of winter (teleuto) spores; 6, germinating teliospore, with sporidia forming at the end of the promycelium; 7, sporidia formed; 8, sporidia germinating on the under side of a barberry leaf and penetrating the epidermis.

—After De Bary.

If the same wheat leaf be examined during the fall, the rust spot will be seen to have become brown or black. The microscope will show the color to be owing to the presence of spores utterly unlike the yellow summer spores. They are dark colored, two-celled, and have a thick, smooth cell wall; and, as their function is to carry the fungus over winter, they are known as winter or telento spores. (Fig. 5,^{5,6}.) In the spring, if placed in moisture, these throw out slender threads, at the ends of which button-like protuberances are formed, known as sporidia. (Fig. 5,^{6,7}.) Under proper conditions these will develop into a new fungus, but, strange though it seems, they will not develop on the leaves of wheat plants, although they propagate readily on the leaves of the barberry. Let us follow it and see what comes of it. The upper side of the barberry leaf soon becomes yellow, and if the spot on the opposite side is examined there will be found a beautiful, cup-like cavity filled with thousands of minute golden spheres, arranged in chains (Fig. 5,¹), known as ascidi-

ospores. If these be placed on the leaves of wheat, the characteristic rust will be produced.

Years ago it was the belief of farmers in England and in the older states of this country, that if barberry bushes were near wheat fields there would be a great amount of rust, and with our present knowledge this can at once be accounted for. On the other hand, rust often appears on wheat in the spring miles from any barberry plants. How can this be accounted for? Repeated experiments have failed to produce rust by sowing the spores on the leaves, and it has been found that all parts of the plant, after the radicle has pushed its way an appreciable distance outside the seed, were proof against infection in this way.

It has also been found that if grain seeds are soaked in a fungicide before they are planted, the amount of rust will be wonderfully reduced. This has given rise to the theory that the teleutospores may be on the seed wheat, and, germinating, infect the young wheat plantlet as the radicle emerges. It is possible also that if the seed wheat came from rusted plants, the mycelium might have been within, and only wanted favorable conditions for development. However it may be accounted for, there can be no question but that the barberry is unnecessary for the reproduction of the rust, although it may and often does supply one generation in the cycle.

For the rust of our grains, spraying is out of the question. Soaking the seeds in solution of sulphate of iron or sulphate of copper has been practiced for many years and is quite effectual. Unless carefully done, however, the vegetative power of the seed is lessened and a poor stand is secured. Hence great care should be used.

During the past two or three years the effect of heat in destroying the spores has been tested and found even more effectual than the copper and iron solutions. The experiments in this country were conducted by Prof. KELLERMAN of Kansas, and it was found that, by soaking the seed for fifteen minutes in water at 132 degrees Fahrenheit, the spores were destroyed and grain free from rust resulted. Care must be taken to maintain a uniform temperature, as anything above this point will injure the viability of the seed; and at even a few degrees below, the spores would not be destroyed.

Of the other injurious fungi, are the black-knot of the plum, the black-rot of the grape, and others of this class commonly known as black fungi. In the State Horticultural report for 1889 will be found descriptions and illustrations of the black-knot, and it need not be repeated here. It may be said, however, that whenever any fungi of this group are found, the diseased plants should be gathered and burned.

The spraying with arsenites, for our insect pests, is now becoming quite common, and, with the new light that is each year being shed on the subject of fungicides, it may be confidently predicted that the day when fungicides will be freely used is not far off.

If it is found that fungicides will answer as insecticides, the problem will be greatly simplified.

BLACK-KNOT IN PLUMS.

The secretary read a letter from Mr. A. J. KNISELY of Benton Harbor, urging amendment of the yellows law so as to provide for inspection of plum orchards for detection and destruction of black-knot.

Mr. MONROE suggested that Oceana county might well take the lead in this matter, as plums are so extensively grown there.

Mr. RICE: The cherry should be included. I know of trees that are a mass of black-knot.

Mr. ADAMS: A committee was appointed at a recent meeting of the Oceana county society to investigate the Tower plum orchard, which is said still to be badly affected, and to destroy cherry trees along the lake shore that also are harbors of black-knot.

Mr. SESSIONS: Is it desired that our society shall take action, or shall it be done here?

Mr. MONROE: I would be glad to have them take the initiative, because of their extensive interests, but it would be well for this meeting to pass resolutions upon the subject.

Mr. COMINGS: Black-knot is in the forests also, and the provisions of the yellows law might well provide for pursuit of it there.

Mr. GARFIELD: We should go to the horticultural committees of the senate and house, rather than get up petitions.

The matter was referred to the committee on resolutions, with instruction to report.

The session closed with the following paper by Mr. L. B. RICE of Port Huron, upon.

MANUFACTURE OF FRUIT PRODUCTS.

In the consideration of the subject allotted to me, I shall confine myself to the workings of the fruit itself and not its juices. I shall briefly outline methods in use at the time of my earliest recollections, and follow the development through to the present time, noting some of the most prominent improvements in their order.

In the early days of the settlement of western New York, the hardy pioneer found it difficult to supply the wants of a large family, with wheat at twenty-five cents per bushel, corn ten to twelve and one half cents, and the only demand for it at that price was at the distilleries, and they were expected to take their pay in whisky—one gallon for one bushel of corn. The best of beech and maple cord-wood at twenty five cents per cord, and store pay at that. It required the most rigid economy, and everything that could be sold had to contribute its share. To this end the products of the young orchard were dried to purchase such articles of apparel as could not be supplied from the "home spun" of the family

GROWTH OF THE INDUSTRY.

Few persons realize the growth or importance of the evaporating industry in this country, or the possibility of its future development; for the work is at present confined to a very small area of our territory, and that is western New York in the main. True, there are other places where there are evaporators, and many of them very large and doing good work, but in no place does the industry take such a hold on the people and become a part of their very existence and life, drawing in every man, woman, and child, as it does in that region. Even the youngest child that can talk, will tell about the "white apples," "chops," and "jelly stock." This is brought about, not by the great evaporators located in the villages and using thousands of bushels of apples each year, but more by the use

of small evaporators by every household in the land. Even those who have little or no orchard of their own, have their small evaporators and work up fruit on shares for others who have more than they can use, receiving one half the product.

It is always said that the poor man has the largest family of children, and herein is his wealth, in this case at least, for he needs no outside help. I know of many such cases where money thus saved has been used for the first payment on a good farm with large orchards, and all subsequent payments were met by the evaporator. Such men could not have invested in an evaporator costing very much; but the small ones costing only \$20 or \$30 were within his reach, and through this he laid the foundation for a good home and future prosperity.

My own recollections commenced in the typical log house of western New York, with its broad fireplace and "stick" chimney. On one side of the low door was the lilac bush and on the other the fragrant syringa, where the little birds always nested. Near by was the tansy bed and a few plants of wormwood, to remind these early settlers that bitter was always near to the sweet in this world. Every evening during the fall, father, mother, brothers, and sisters, and the hired help, gathered in a wide circle around the great fireplace with its blazing logs; a few baskets of apples or peaches were ranged in front, while on the table stood a huge wooden bowl, into which the quarters were thrown, and we younger children gathered around this with our needles and strings of tow spun from the waste of the flax used in making our summer clothes, to string the apples, for drying. Machines were unknown, all the work being done by hand. Strings of apples were hanging on each side, and over the fireplace, and from the chamber floor timbers overhead, and wherever else they could be dried.

The first step in advance from this was the use of boards to spread the apples upon without stringing. But a few wet days made trouble. These racks were made to suspend over the stove and around it. From this the transition was easy to a room set apart for the purpose and a stove placed in it for drying the fruit, but the danger of firing the house led to building a small house away from other buildings for the purpose. This was termed a dry-house. We dried apples then; now we evaporate them.

In 1857 a man by the name of Mason of Marion, N. Y., brought out a little portable dry-house with a sheet-iron heater that has done more for the industry than any other ever invented. Thousands of them were sold and despite all the improvements in all of these years, thousands of them are in use now in Wayne county, N. Y.; and just as good work is done by them as by the large evaporators, one with capacity for ten to twelve bushels per day costing only from \$20 to \$25.

This cheap evaporator is of the greatest value to the small-fruit grower. If the market drops for a day the surplus can be dried, or if at any time continued wet weather hinders the pickers until the berries are too soft for market they can be saved in this way. In this line, a very important industry has sprung up in the state of New York, namely, the growing of black-cap raspberries expressly for evaporating, the average profit being about \$100 per acre.

I would just add in connection with this that the patent on the Mason evaporator expired years ago and any one who chooses can build and use them. I can give plans to those desiring.

THE FIRST LARGE EVAPORATOR.

The first to build on a large scale was Alden. Doubtless you are all familiar with this evaporator. It consisted of a tower about four feet square on the inside, built from the basement through a two-story building, and out at the top like a huge chimney. Steam radiators were first used but did not give satisfaction; then hot air from a furnace in the basement passed up through the fruit. The apples were put on thirty or forty trays, the one over the other, the fresh apples being put in near the ceiling of the second floor and gradually lowered to near the floor of the first story, where they were taken out. This seemed to be the most philosophical method, but experience told differently. The fruit was badly scorched when brought near the furnace in a nearly dried condition. The process was reversed and proved more satisfactory. His device for raising was an endless chain, and as often as a tray of fresh apples was introduced at the bottom a tray of dried ones was taken out at the top.

This type of evaporator came out with a great many variations, and with as many different devices for raising the trays, all depending on the hot air currents through the apples for carrying off the moisture. Alden claimed that his patent covered the use of hot air in that way and commenced litigation to sustain his rights. A combination contested his claim; the struggle continued several years and finally resulted in his defeat.

In the first evaporators, slats of wood were used for the trays, then common iron wire; but that would rust quickly and mark the apples. This brought about the use of galvanized iron wire, of which so much has been said of late on account of Germany and Holland destroying several large consignments of evaporated apples in which traces of lead and zinc were found. After this they refused to receive apples unless accompanied by certificate that they were free from any traces of poison. This is a matter that should demand the attention of this society in its discussions. Horizontal evaporators have been in use for some time, with natural or forced currents of heated air. They were brought into favor during the late war and were used in preparing desiccated vegetables for the soldiers, to keep off scurvy.

USE OF STEAM.

As stated before, steam radiators were used in the first Alden towers. Many others tried steam in a small way, but it was not at all satisfactory.

Of late, however, it has come into favor and is used very largely in a different manner, the heat being diffused among the trays by means of a system of steam pipes. The results are so satisfactory that steam will soon be used in most of the large factories. In fact, the indications are that the old hot-air tower will be superseded and soon become a thing of the past. Some of the advantages of steam are that the evaporator is more compact and on one floor. Steam can be used from a mill or factory after having been used in other work, the dead steam being worth 90 per cent. of live steam. Where a good supply of steam so used can be obtained, it makes the heating of the evaporator cost very little indeed. A third advantage in using steam consists of passing it from the evaporator through the work-rooms for warming purposes.

There are already many claimants for public favor in the field, with

their patents and devices for the use of steam in evaporators, some giving very satisfactory results while others have their peculiar faults. But in all the devices used in the manufacture of the fruit, whatever the claims are of one machine or combination of steam pipes over another, whether it be the great steam evaporator, the hot-air tower, the two brick walls, or the small portable evaporator, steam is one and the same object—that is, the production of the largest results with the smallest outlay for labor and fuel.

It makes little or no difference what evaporator is used. Care, neatness, and prudence produce the same results in either case. The apples from one command the same price in the market as those from the other, depending entirely on the manner of the work, not the mode.

MONEY IN SMALL EVAPORATORS.

The advantage in the small evaporator is that it gives the poor man a chance to share in the profits with his richer neighbor. I make bold to say that you may take any honest, industrious, sober man of good judgment, economical in all his habits, and one who has a wife with the same general qualifications, and with a family of from six or eight to ten or fifteen children (the more the better)—you take such a man and put him in the way of purchasing a cheap evaporator, and let him work up fruit for one half the product, and in less than fifteen years he will own one of the best farms in the vicinity; his sons will drive in their own carriages, and his daughters will have their organ or piano. This is no fancy sketch. I know of a great many such cases. A woman with two or three children will work up an average of fifteen to twenty bushels per day, with the waste, or 100 to 140 pounds of white apples and 20 to 25 pounds jelly stock, which, at an average price of $7\frac{1}{2}$ cents per pound for the one and $2\frac{1}{2}$ for the other, would give her from \$400 to \$500 for the season's work of ninety days—certainly a snug little sum.

COST OF OPERATING LARGE EVAPORATORS.

Many of you would like to know the average cost of a steam evaporator with expense of running and chances for per cent. of gain. I will try to give you the figures. We will, for example, take one with capacity for 200 bushels and waste per day. Cost of such an evaporator, including 100 galvanized wire trays, 1,500 feet of steam pipe one inch in diameter, with connections for the boiler, but not including the boiler, \$600; machinery necessary, such as parers, slicers, choppers, etc., \$100; bleacher, \$25 to \$50; all ready for work, \$750. Help needed to run this will be four persons (boys or girls), 60 cents per day; eight trimmers (women), 60 cents; two spreaders, two sorters (women), 60 cents; five tenders or waiters (boys), 60 cents; one bleacher and for other work (man), \$1.25; two night workmen, \$1.50 each; one foreman \$2, making in all 25 persons costing \$19 per day. Add to this 1,500 pounds of soft coal, 20 pounds of limestone, with wear and breakage of machines, etc., and you have the cost of producing 1,200 to 1,400 pounds of white apples and about 500 pounds of waste. This may vary a little, according to quality of apples and skill of workmen and economy of management, but may be depended upon for average results.

This product of the day is worth, at ordinary prices, say $7\frac{1}{2}$ cents

white apples, about \$100. If he has bought his apples for 20 cents per bushel and managed carefully, he has made from \$25 to \$30 for his day's work, or between two and three thousand dollars for a season of ninety days. With good storage for apples the season may be prolonged another month. If the owner of the evaporator is also the worker of his own apples, it is so much the better.

Just here I wish to say that the importance of this industry can not be estimated by the per cent. of profit that may be realized by the man or company that may come into your vicinity and erect a large factory, buy his or their apples at the lowest price possible, hiring all help at the lowest prices, and then, at the end of the season, taking away his gains to be spent in some other place; but by the smaller evaporator owned by the men who own the apples or do the work, also in the work that it gives to every person in the community and the money that it puts into circulation.

SOME ACTUAL FIGURES OF PRODUCTION.

As an example of the amount of money brought into a place through this source, I will give you a few figures. In the year 1887, Mr. A. B. Williams, a merchant in the little village of Sodus, N. Y., bought 3,500,000 pounds of white apples at an average of seven and one half cents per pound

For which he paid.....	\$262,500
300,000 pounds chops, 3½ cents.....	9,000
600,000 pounds skins and cores, 2½ cents.....	15,000
125,000 pounds dried berries, black-caps, 22 cents.....	27,000
6,000 pounds plums, 10 cents.....	600
4,000 pounds peaches, 12 cents.....	480
In all.....	\$315,080

These figures are reliable, as I took them from the books. Other buyers would easily have carried the sum total paid out in that village to half a million dollars, which is no small sum to be divided in a community. And further, you must remember that this is shared by every man and woman, boy and girl, that could possibly be spared from other work. Let me take you for a moment into the storehouse where these apples are handled. First, in the room where the apples are received, is one man weighing and two men handling bags and two emptying them. Next, in the packing room, is the superintendent, one weigh-man, five packers, four facers, and six ring-pickers—seventeen persons in all. The six ring-pickers pick out the best rings for facing in the boxes. The facers arrange these rings on the bottom of the boxes, this side being opened first; the boxes hold 50 pounds each. It required 70,000 of these boxes to pack the white apples bought by the above named firm, and they loaded 140 cars. The head of one box-making firm in the same village tells me that in that year he made 75,000 fifty-pound boxes, using 32 car-loads of pine lumber, or 800,000 feet of half inch boards, 600 pounds of glue, 2,500 pounds of nails, and employed seven men and two boys.

The packing of the apples began Sept. 1 and gave employment to the help until the following April.

WHERE IT IS MARKETING.

The question naturally arises, where does all this fruit find a market? Dealers in New York write me that Germany and Holland are their

largest purchasers, while those in Chicago say their apples supply the great northwest and west. Parties in San Francisco sell all along the western coast and to the islands of the Pacific, many being used in Australia.

Western New York, the cradle of the evaporating industry, continues to lead the world, not only in the quantity but the quality of evaporated apples. It is also the greatest producer of evaporated raspberries. Delaware, North Carolina, and Georgia are the leading producers of dried peaches. Blackberries come from North Carolina, cherries from Virginia, while California sends the apricots.

DANGER OF USE OF GALVANIZED WIRE TRAYS.

In relation to the use of galvanized wire trays, in the beginning of the season last year there was a good deal of talk about it, some buyers paying one cent per pound more to those who used wood, and furnishing strips free to be put on over the wires; but with the advancing prices of a short crop this was soon lost sight of and it was found that it took nine to ten per cent. longer to do the work on wood. So things soon lapsed into the old way.

But the time is surely coming when people in this country, as well as in Holland and Germany, will refuse to use apples in which are to be found, however slight, traces of lead or zinc poison. I would advise that some action be taken to stop the use of galvanized wire for trays.

Objections are also made to the use of sulphur, but where it is used with discretion, on apples not sliced, I don't think any trouble will follow. But care should be taken not to use too much, nor to use it on previously sliced apples.

THERE WILL BE NO OVER-SUPPLY.

In the year 1888, there was an over-production, and prices went down ruinously low. Men wore serious faces and asked each other, "What are we going to do?" but none could answer.

William Barry, acting chairman of the Western New York Horticultural society, under his father, the venerable Patrick Barry, president, at the winter meeting tried to console the members who were largely interested by saying that the low prices and surplus stock would have the tendency to open new markets that would result in an ultimate increased demand for the increasing supply. But the large stock has been reduced in an unexpected manner. Last year there was a partial failure in the apple crop in western New York. Evaporator men scattered through Michigan, Ohio, and Canada, and bought apples by the carload of their more fortunate neighbors, to keep their factories running. In the meantime the short crop gradually restored prices to their old point.

This year has been worse than last, to these interests. The crop of western New York was not one half of one per cent. of an average. Those men whose means would permit, took the essential parts of their evaporators to distant places where apples could be purchased, while those who could not do so, but have been compelled to remain at home, have turned their attention to drying pumpkins, squashes, potatoes, or anything else that had moisture in it, except the weather.

What will be the result? Simply this, the demand can not be supplied.

Should even there be a full crop next year, prices will not be forced down again very soon. If the crop should be short, prices will go way up. So, in any event, next year bids fair to be the most prosperous one to the trade we have ever had; and the man or company who engages in the business with industry and economy will surely be a reaper in the general prosperity certain to follow.

Thursday Morning Session.

At the opening of the last session, Mr. N. A. BEECHER of Flushing read the subjoined paper upon

INFLUENCE OF THE STOCK AND GRAFT.

This is no new subject, I am well aware; and yet, when we consider that the union of the two is to become the foundation of the orchard, and that we as horticulturists, and all admirers of fruit, are more or less dependent upon this relationship, this union, for the best known and choicest varieties of the apple, pear, peach, plum, and some of our smaller fruits, it is a question of great magnitude and importance.

In selecting the stock and scion of the different species to be propagated, it is as necessary that we study the character of the two to be united, as to what is desired in the plant and fruit, as though we were about to engage in the propagation and perpetuation of the choicest breeds of horses, cattle, sheep, and swine.

A point once gained by judicious selection, in this way, becomes fixed, and upon it we may enter with safety. By this process, this law of assimilation combining health, strength, vigor, and hardiness, we are able to multiply and perpetuate the choicest selections of fruit. It has long been known that the Red Canada and some other varieties do not do well when root-grafted; and the experienced fruitgrower could not be induced to plant such an orchard, even at a gift price.

The question of stocks has sometimes come up in our local societies and we have sought for practical experience among our members and those in attendance, but have never been able to secure all the information desired, notwithstanding the valuable knowledge often sought and found in our much esteemed horticultural publications.

Ever since the severe winter of 1874-5, and especially the winter of 1884-5, there has been a laudable anxiety among practical fruitgrowers to know the best stock upon which to graft some of our leading commercial, tender varieties, especially the Baldwin, King, and R. I. Greening, with view to making them more hardy if possible.

Allow me to digress a little here, by saying that the winter of 1874-75 froze my Baldwins, Kings, Esopus Spitzenburgs, Peck's Pleasant, Swaars, and Porters dead to the snow line, while the R. I. Greening and some others were black-hearted and worthless.

The Boston or Roxbury Russet I discarded from the nursery before the cold winter of 1874-75, not knowing that freezing was the trouble. The severe winter of 1884-5, ten years later, cleaned out our peach trees quite generally, while dead and dying fruit trees were found the following

spring all over this lower peninsula. I saw in Oakland county, on the plains, large apple trees, most of them Baldwins, dead and dying by the acre. It was a terrible slaughter.

A great many fruitgrowers declared they never would plant any more Baldwins or tender varieties. But as time wears on we change. Our admiration for the Baldwin comes back. Knowing well its excellence and commercial value, we are induced to try again, and in my opinion not without hope; for we have good stocks upon which to graft the Baldwin and other tender sorts, that will stand our rigorous climate, especially in this lower peninsula, and the Lyscom is one of them.

I had Lyscoms in the nursery the cold winter of 1874-5, one and two years old, and they were not harmed in the least, not even the terminal buds. The Lyscom not only has the hardiness, but the health, vigor, and potency, as far as my experience goes, over any other stock I ever grafted. And now for the proof.

I will give you my observation and experience with the Red Canada: (1) root grafted; (2) top grafted on seedlings four years old; (3) on Northern Spy; (4) on Lyscom, compared with all the rest; (5) on Transcendent crab.

ROOT GRAFTED.

Time, 26 years, giving circumference. Soil, clay loam. Tree No. 1, 28½ inches; No. 2, 28; No. 3, 33½; No. 4, 35½; No. 5, 36½; No. 6, 37½; average, 33 1-6.

TOP GRAFTED ON CHOICE SEEDLINGS FOUR YEARS OLD.

Time, 22 years; soil, sandy loam. Tree No. 1, circumference, 24 inches; No. 2, 26; No. 3, 30½; No. 4, 32; No. 5, 35; No. 6, 38½; average, 31.

TOP-GRAFTED ON NORTHERN SPY, THREE YEARS OLD.

Time, 25 years; soil, clay loam. Tree No. 1, circumference 37½ inches; No. 2, 37½; No. 3, 38; No. 4, 38; No. 5, 40; No. 6, 41; average, 38 3-7.

TOP-GRAFTED ON LYSKOM, TWO YEARS OLD.

Time, 22 years; soil, sandy loam.

Have only three trees thus treated. Tree No. 1, circumference, 46½ inches; No. 2, 47; No. 3, 47; average, 46 5-6.

Comparing the Red Canada on Lyscom with Red Canada root-grafted, we have a difference of 13⅔ inches in circumference in favor of the former, giving the latter six years' advantage in time.

Comparing Red Canada on Lyscom with Red Canada top-grafted on seedlings, we have a difference of 15 5-6 inches in circumference in favor of the former, giving the latter two years' advantage in time.

Comparing the Red Canada on Lyscom with Red Canada on Northern Spy, we have a difference of 8 17-42 inches in circumference in favor of the former, giving the latter five years' advantage in time.

RED CANADA TOP-GRAFTED ON TRANSCENDENT CRAB.

The scion outgrows the stock.

I have concluded to add two other experiments to this paper.

BALDWIN ON TALMAN SWEET, THREE YEARS OLD.

Two trees. Time, 20 years; soil, clay loam. Tree No. 1, circumference 35½ inches; No. 2, 36 inches. Trees sound and healthy.

LYSCOM ON SEEDLINGS THREE YEARS OLD.

Time, 28 years; soil, clay loam; three trees. Tree No. 1, circumference of stock 38 inches; circumference of graft 47 inches, a difference of nine inches. Tree No. 2, circumference of stock 41 inches; circumference of graft 42 inches. Tree No. 3, circumference 47 inches, union perfect.

The Red Canada top-grafted upon the seedling, according to experiments given, varied more, as to size, than when root-grafted, and frequently outgrew the stock. *Vice versa*, the stock in some cases outgrew the graft.

Red Canada on the Northern Spy made a complete union, each keeping pace with the other, and this was especially true of the Red Canada on the Lyscom, each producing a marked uniformity in development.

The last two experiments speak for themselves.

Tender varieties "double worked" on the Lyscom, or on some other hardy, vigorous stock, will not only be hardy and strong but will be uniform in size and shape.

As a further proof of my confidence in the above facts, I am going to plant another orchard on this plan, for my youngest son, and hope he may be spared to publish the results in the horticultural works of Michigan.

Mr. A. B. COPLEY asked if a difference as to fruiting had been noticed between the root-grafted and top-grafted trees. Mr. BEECHER replied that it had been, and was in favor of those top-grafted.

Mr. J. N. STEARNS: Whatever stock is used, it has an influence upon the root. Red Canada upon seedling stocks will produce small roots; Spy will produce large, spreading ones; Oldenbergs, large roots running straight down and hard to dig. Therefore, Red Canada should be top-grafted upon some vigorous-growing stock.

Some one spoke of Talman Sweet doing well for this purpose, knowing none better. It is hardier than Spy.

Mr. BEECHER: I have found Lyscom better because of its strong roots. It is better at two years than Esopus at four.

Mr. STEARNS: Colvert would do, only it roots too near the surface and therefore is not as good as Spy or Talman Sweet.

To this Mr. BEECHER agreed and said the Greening is especially good upon Lyscom, and that he would not take Red Canada on seedling stocks even if given him. At best they would be variable, while on Lyscom they will be of uniform size.

Mr. STEARNS: It is a great mistake to suppose that seedlings are hardy. They are tender as a rule than budded sorts.

Mr. L. B. RICE referred to an orchard of 265 trees in western New York, the growth of which, especially the Baldwins, was thrifty as could be, but

its fruitage was very inferior, Baldwins especially again, and this despite good care. They were all on Colvert stocks.

Mr. MORRILL; I have Oldenberg on Rambo and Talman Sweet, but the latter yield nearly double the amount of fruit of the former.

RESOLUTIONS.

Following this paper and the ensuing discussion came the following report from the committee on resolutions, which was adopted unanimously and with a rising vote:

Resolved, That we fully appreciate the courtesy of the press in making so full a report of our sessions, and particularly do we wish to express our appreciation of our veteran president, our esteemed secretary, and our unequaled vice-president, whose united labors have added vastly to our interest and benefit in these meetings.

Resolved, That it is the opinion of this society that a law should be passed without delay, which shall make it the duty of the yellows commissioners to take very thorough care to destroy all of the diseased portions of trees of the plum and cherry which have black-knot. We have good reason to believe this to be a contagious disease which is spread from tree to tree unless all portions of the diseased trees are burned as soon as possible after its appearance.

Resolved, That in the opinion of this society the time has come when this state should have an active, energetic forestry commissioner, and that the legislative committee already appointed by our board, Messrs. Watkins and Monroe, be instructed to press the need of forestry legislation upon the legislature.

Resolved, That we wish to express our high appreciation of the extremely interesting paper of Rev. Caroline J. Bartlett. It was a gratifying illustration of the graceful addition of feminine talent in horticultural affairs.

Resolved, That the thanks of this society are due to Mr. J. N. Stearns for his kindly efforts in providing so pleasant a place for holding our meetings, and his offices in many ways adding to our comfort and pleasure.

Resolved, That this society enters its most earnest protest against any opening of the Columbian Exposition on the Sabbath. We believe it will prevent many from taking part or in making a display, and is in antagonism to the best American thought and custom. We believe its effect will be an oppression of labor and conducive to disorder. We remember with pride the stand taken by one of America's most eminent inventors, at the Paris Exposition, who closed his laboratory on Sunday as an expression of American principle.

Resolved, That we declare the classification as shown under title "Department B," of the Columbian Exposition, to be wholly irregular and incorrect, and likely, if adopted, to reflect great discredit on American horticultural experts. We declare the general term, horticulture, to be the term in use by experts and by common understanding, for the second great department of agriculture, which includes in its significance the groups pomology, floriculture, arboriculture, and viticulture, and should be used to designate the second great department of agriculture, which includes the above subdivisions. We also do most earnestly protest against the prominence given in said schedule to the manufacture of wine and brandy, as an important feature of horticultural products, which in view of its injurious economical effects and the moral stigma which adheres to this product in the best and general American thought, seems wholly out of order and place. If this should be allowed and the precedent followed by the makers of intoxicants, it will give the impression that the great Columbian Exposition is largely an advertising medium for a trade, the infamy of which may well cause every American to blush with shame that such a product is allowed on our soil in this enlightened age and in this professedly Christian land.

We emphasize our protest.

S. H. COMINGS,
W. A. TAYLOR,
A. J. COOK.

REPORT ON PRESIDENT'S MESSAGE.

Following this, was submitted the subjoined report upon the president's message, which also was adopted:

The committee on the president's address submitted the following:

We have noted the various suggestions offered by President LYON, and recommend the following action: The executive board have appointed the president and secretary a committee to confer with the county and local societies, to secure a re-establishment of the former auxiliary arrangement. We recommend that the action be approved, as it can not fail to benefit the cause of horticulture, and will secure a proper distribution of the Reports. Regarding the distribution of the Reports in the northern portion of the state, to farmers' clubs and similar organizations, we recommend that it be left with the president and secretary with full power. We advise that the exchange of our Reports with sister societies, boards of agriculture, etc., be continued whenever practicable. We believe the society should accept the offer of the division of pomology, and would urge all members to furnish their names to our society that they may regularly receive these periodicals. The bulletins of the state experiment station and the report of the state board of agriculture will also be furnished free of expense to any member of this society, and a request is all that is necessary to receive them. The matter of legislative appropriation for the Columbian Exposition has already received attention by the executive board, and Messrs. Monroe and Watkins were appointed as a legislative committee. We can only assure them of our hearty support and best wishes for their success. In case arrangements are made with the Detroit Exposition for the coming year, we believe some steps should be taken to secure the accurate nomenclature of the different exhibits. We recommend the appointment of a special committee who shall perform this work if called upon to do so. While the report of the society for 1889 was delayed by the illness of the secretary, we trust his new lease of life will permit him to place the copy for the next report in the printer's hands soon after the opening of the new year.

L. R. TAFT,
S. H. COMINGS.

The secretary was instructed to certify to the officials of the Columbian Exposition, the resolutions against Sabbath opening of the World's Fair.

Mr. ROLAND MORRILL of Benton Harbor read a paper, here given in full, upon

THE FUTURE OF COMMERCIAL FRUITGROWING.

The question which interests the grower of fruits for market more than any other, is the question of profits, and includes so many and so varied circumstances and conditions that it demands our deepest thoughts and best judgment to make the business profitable.

The fact that ordinary, slipshod, hit-or-miss fruitgrowing has been profitable in the past, must not be accepted as evidence that the same methods will be successful in the future, for the profits secured in the past have caused a wonderful extension of the business, which now has at its head some of the best business men in the country, with abundance of capital, planting and managing orchards and plantations of such size as to cause us to wonder where and how the product is to be marketed.

Think of apple orchards ranging from 40 to 1,000 acres each, being set all over the great state of Missouri, and running as high as 1,400 acres in Kansas, with orchards of 40 to 100 acres common in a large portion of Illinois and Arkansas—then tell us what you are going to do with your apples when all these fine orchards of Ben Davis, Willow Twig, Jonathans, Winesap, Huntsman's Favorite, etc., begin to pour their annual product into the markets which we have called ours for years.

We must not flatter ourselves that they will not succeed, for they have a favorable soil and climate, with plenty of brains and capital—in fact, one of these mammoth orchards sold this season \$70,000 worth of apples and is not nearly all in bearing yet. We find the same thing repeated in

peaches and grapes, the largest peach orchard now in bearing being nearly 800 acres, with numerous others nearly as large to soon come into bearing; and we are informed that a company was formed last July, in Ohio, to plant 200,000 peach trees in Fort Valley, Georgia, next spring; and numerous other similar enterprises are being located in the successful peach-growing regions. So with grapes, and to a lesser extent with berries, but not so much with pears.

We do not mention all these facts with any intention of discouraging Michigan growers, but to call their attention to what they must compete with in the near future, and endeavor to point out the only safe course to pursue, and impress them with the idea that the very best methods will be none too good in a very few years, and that the struggle must result in the survival of the fittest.

It is no time to sit idly down and mourn, if your crops do not pay as well as you might wish, but it is a good time to begin laying a foundation for better work by hustling around after better knowledge of your business, studying the methods of the most successful growers, and improving upon them if you can.

Do not attempt to grow everything, but confine yourself to the fruit and varieties of fruit that succeed best on your soil; then grow enough to attract attention, put it up for sale just as you would wish to purchase it, make it just as good as you possibly can, and practice no deception whatever. When you put up a barrel of apples, see that it holds three bushels and not nine or ten pecks. If it is a quart of berries, see that it is a quart and not three fourths or seven eighths of a quart, and see that all the big ones are not on top. In short, make all even packing throughout.

Now let us see what methods are practiced by our heavy commercial grower of today. He first ascertains what varieties of apple are favorites in the market, then learns where they are grown the most successfully, looks the country over and buys a large tract of the best land he can get; then goes to some reliable nursery and selects such trees as he wants, fits his ground properly, sets his trees right, puts some reliable man in charge of the work, then attends to other business, visiting his orchard occasionally. If the purchase is made in Missouri, the land costs \$5 to \$15 per acre, and the varieties set are Ben Davis, Willow Twig, Winesap, Jonathan, Missouri Pippin, and Huntsman's Favorite. Then, in six or seven years, they begin to give him crops of fine fruit. The orchard is now worth \$100 to \$300 per acre and will continue to pay a large interest on that sum for ten or fifteen years.

If he prefers peaches, he may come to Michigan or he may go to the mountain regions of Tennessee, Mississippi, Arkansas, or Missouri, where they succeed. It makes little difference where, provided the soil and climate are adapted to the crop and there is a railroad convenient, as our shrewd commercial grower can get good rates if he has enough fruit to make it an object. Then, with a competent selling agent or commission man, and refrigerator cars when needed, he can put his fruit upon the market where it will bring the most money, and a sample package drawn from any part of the car can be used to sell the entire lot, as the owner is a shrewd man and knows that a square deal brings round dollars; and he can sell carloads faster than most men can sell wagon-loads.

The grape business is rapidly drifting into the same channels. I have now in mind one young man in Illinois who, after shipping his crop from more than 100 acres, in 1889, went to New York and bought seventy car-

loads in order to supply his customers in the northwest until the close of the season; and so it goes all along the line.

Some will say it is the same old story of the big fish eating the little ones; but such is not necessarily the case, as the smaller growers in certain localities have organized unions or exchanges by which they secure all the advantages that the largest shippers get; but in every case they select one of their best men to do the business for all. One of these unions is located in the state of New York and is managed by a Mr. Fay. I have never seen any man connected with the organization, but am familiar with the Chicago end of the deal and think the business must have been very satisfactory all around, as at least half a dozen of the largest commission houses on South Water street are regular purchasers from Mr. Fay, and always in car lots, the lowest price paid being 22 cents in the car for eighth baskets, and the freight is about two cents per basket. The buyers order in car lots, by telegraph, with perfect confidence, for, although they were packed by different men, they were always in a certain package, honestly packed, with a high standard. Pears and currants were handled from the same locality in the same manner. This is no more than can be done at any fruit-shipping point in Michigan, if our people have enterprise enough to make a start and are honest enough to hold the trade when once we get it, for it is a stubborn fact that no state in the Union produces finer flavored fruit than Michigan, and few, if any, produce more of it. But our convenient shipping facilities and good markets have caused us to fall behind in the business of marketing. Other localities, so situated that they could not market to advantage without combination, have combined and are today far in advance of us.

Of the benefits of co-operation our Kalamazoo friends can no doubt tell us something, as they have applied it with great success to their immense crops of celery, and the fame of their beautiful city has been spread the length and breadth of the country by the enterprise of their celery-growers and dealers, more than by all other agencies combined. I have been very much surprised to find that Kalamazoo celery appears on the bill of fare of all the leading eating-houses and hotels of the southwest, even to the borders of old Mexico, and I do not know how much further; and it appears on their tables as fresh and crisp as at home—thanks to the skill of the packer and shipper at Kalamazoo. Now, does any one present think that if the celery-growers here had followed the example of the Michigan fruitgrowers they could have ever attained such prominence or made the money they have? It is certain that had they followed such a course the business would have died out long ago.

Look again at the immense fruit interests of California. See how they are handled—shipping agencies established at various points handling immense quantities of green and evaporated fruits, which enables them to get low rates of transportation, and they enter all our markets with choice fruits put up right, selling on their merits, and winning every time.

The orange-growers of Florida are taking care of themselves in a similar manner.

We have so far indulged in this random manner of writing, for the benefit of such of our people as do not know what our competitors are doing all over this broad land, in order that we may know just the basis upon which to make our calculations for the future.

As a preface, I would say that it generally falls to the lot of some good-natured fellow at these meetings to point out some disagreeable facts con-

nected with the business, and perhaps lift the veil a little that we may see ourselves as others see us. So we hope, in considering this question, that if we should expose to the world trade secrets that are not to our credit, we will be excused on the ground that we are trying to reform.

In concluding this matter we will take the business as we find it in Michigan today. Take the apple business for instance. We find orchards of all descriptions—good, bad, and indifferent, some very profitable, others a continual loss. While there has been some excuse for this condition of things in the past, owing to the lack of knowledge regarding varieties, their adaptability to our soils, etc., that excuse no longer exists; for if any man will avail himself of the opportunities offered him for gaining knowledge on all these matters, he need make few mistakes. We also find a great many orchards which should be profitable, but fail, owing to lack of good judgment in marketing. You may travel all over the state and in not a single county will you find a reliable and prevailing standard of packing apples. You will find barrels ranging from 2½ to three bushels; you will find some men packing all grades in the same barrel, with the best near the heads; also, some who leave out enough of the poorer grade to make a barrel of cider. But occasionally you will find a man who uses a full-size barrel and packs only two grades of fruit, each one packed honestly, selling the poorer fruit to the evaporator and cider mill. This man is the pioneer of the successful orchardists of the future.

In the grape-growing sections we find the same lack of a standard. We here find slight variations in the size of the baskets, for the purpose of defrauding the buyer, and we also find large plantations of the miserable Champion sent to market with the expectation that they will be sold for Concord; and they do succeed to the extent of damaging the sale of Concorde. The growing of such fruit should be discouraged as detrimental to the fruitgrowing interests of the state.

In peaches the same practices exist, with variations. Some growers are reliable, others are not, but nearly all practice a mild form of deception in the use of tarlatan.

In berries the practice of deception is very common, both in the size of the package and the manner of packing, but it is evident to a close observer that the day is not far distant when the scalawag grower or packer will find no place in the markets. Already you can hear his wail. His sales are not satisfactory, and he begins to call other people dishonest, forgetting who first set the example; but I think that the intelligent grower has little or nothing to fear from this class of people, as they have plenty of "rope" and are fast hanging themselves financially.

So much for the conditions as we find them today. Now, the question occurs, what course shall we pursue in the future to make our business profitable? In the first place, the successful grower of the future must be a thorough business man. He must be thoroughly versed regarding varieties and soils. He must know what the market wants and how it is wanted. He must be an entomologist and understand the best modes of insect warfare. He must know something of fungi and fungicides; he must be an experimenter; he must be built on a broad-gauge and liberal plan, and above all must be an honest man. If so, he will have some confidence in others and can combine with his neighbors in the deep search for knowledge and wealth.

In conclusion, we would suggest the consideration of a few matters which are beginning to cut quite a figure in our business. First is the

transportation problem. Very few men can understand how it is that grapes can be transported from the state of New York to Chicago for about one half what they can be sent from this state for; but the reason is that all east and west roads are compelled to haul a great many empty cars west, after grain, and are glad to load with anything that will pay running expenses; while most of our Michigan roads are hauling their heavy loads toward Chicago and their empty cars the other way. In this respect we labor under a disadvantage. Our steamboat lines are giving us excellent service from the lake ports, at moderate prices, but of course they can not give us as low rates as they might if they could get full loads of profitable freight back.

We must also bear in mind that the day is past when a shortage of any article can exist long in any large city, unless it exists all over the country, as the railroads and steamboats are constantly engaged in distributing our products, and with the refrigerator cars and rapid train service of today any advance in price in any city is met with a full supply as soon as the telegraph and steam can accomplish it.

Another element to consider is the immense cold-storage houses in operation, and being constructed, in all our large cities. Apples are now put into cold-storage in October, to be taken out in May, at a cost of 50 cents per barrel; and if sound when put in they come out sound, as they are kept at a desired temperature without a variation of more than one degree. Other fruits are kept for a shorter period, very successfully, thereby equalizing the supply; and soon it will be no object for any farmer to hold his fruit for higher prices, as it can be done so much better in the cities.

Another element which must result in good to the Michigan fruitgrower, is the tariff legislation of 1890, which places 25 cents per bushel on apples and a corresponding duty on other fruits and fruit products. Of course, in a season of general failure, like 1890, there is no trouble to sell fruit; but our experience has been that in years of plenty our Canadian neighbors have filled our markets full of good apples in good three-bushel barrels, and a great many Michigan apples have rotted down; and the cash which should have gone to some citizen of the United States has gone to Canada or Nova Scotia. Although we have deserved just such punishment, it is not likely to occur again as long as our new tariff law stands; but unless our Michigan farmers will now come to the front and give the consumer as good fruit, in full-size packages, as our Canadian friends have done, I should be in favor of removing the tariff and letting the best man win.

On the whole, the future is bright enough for bright men who keep abreast of the times, but for the sluggard or the ignorant man it is certainly very dark financially. We can each determine for ourselves which course to pursue, and no doubt will reap a reward according to our merits.

Mr. L. H. STODDARD of Kalamazoo remarked that it was a disgrace to Kalamazoo county that there had been no greater attendance, both on account of the celery and the fruit interests. There are scores of growers of one or the other who should have been at every session. Referring to the bad results of irregular sizes of packages, he asked if he could afford, in marketing his fruit in the city, to sell in dry measure quarts instead of wine measure quarts, and three-bushel barrels instead of two and three

quarter-bushel barrels. His impression was that the better plan is to use the measure others use, but pack honestly.

Mr. MORRILL: That is my friend's opportunity. City buyers will notice the difference very quickly, and he will have no trouble to get and hold a permanent trade. When Chicago buyers take a whole orchard of apples, they always pack in full-size barrels. Three pints per case is all the difference there is in berries, between dry measure and wine measure, but the difference obtainable in price amply compensates for this, and more too. The difference in price of the full and "snide" barrel of apples is from 50 to 75 cents, while the extra cost of the larger barrel is but five cents. Practically, this makes the extra peck sell for 50 to 75 cents.

Mr. STEARNS: Both these gentlemen are correct. One sells in Chicago, the other in Kalamazoo. I began selling here twenty-five years ago. For ten or twelve years I used full-size packages and tried to educate the public; but I found it was useless, and since have used wine measure packages. Buyers here will not discriminate, but in Chicago dealers will decide very quickly in favor of the larger measures.

A voice: Is there a legal barrel?

Another: Yes; a contract naming so many barrels would require three bushels to each.

Mr. COMINGS: The full-measure package adopted by the Cranberry association holds 100 quarts. This is standard; and they are so branded and may be relied upon.

Mr. BEECHER: Custom in Genesee county requires use of the three-bushel barrel. It proves more satisfactory than others, both to grower and seller.

Mr. TRACY: There is a way out of all these difficulties, and the Californians have found it. It is to sell by weight. [Applause.]

Mr. A. J. MURPHY of Plainwell: I have just found out that a barrel is not necessarily three bushels. No other measure of a barrel is known in my vicinity.

Mr. MORRILL: We should come to a standard, whatever it is, and adhere to it.

Mr. MONROE: Howells' Statutes, page 447, fixes 48 pounds as the measure of a bushel of apples "whenever sold by weight." On page 448, third-bushel packages of peaches are required to contain 716 and 4-5 cubic inches. On the same page the "quantity making a barrel of fruit, etc.," is thus described: "that quantity contained in a barrel made from staves 27 inches in length, and each head 16½ inches in diameter or ordinary flour-barrel size." Another section requires that packages of less than one bushel shall contain the full amount represented according to "the bushel of 32 quarts." There is, of course, a penalty for violation of these provisions.

Mr. MORRILL: Then every fruitgrower is a criminal.

The closing number in the programme was by Prof. A. J. Cook of Michigan Agricultural college, who read the following paper:

CURRANT BORERS.

The importance of the currant among our common fruits is hardly appreciated, even among our best pomologists. The general farmer sets a

few bushels in one corner of the garden, and, with the exception of a little spasmodic cultivation, and in late years dusting or spraying for the slug, he gives these plants little attention. Yet what a comfort to the housewife, in early summer, as she finds ample supplies for delicious sauce and most appetizing pies! And what a satisfaction the year through is the jam and jelly, ever ready to grace the table or flavor the cake! Thus, while the currant vineyard of the farm receives attention all too meagre, its fruits are appreciated at least by the best part of the farm household.

But is not even this partial appreciation often wanting among our specialists? In other words, does the currant plantation occupy the attention it deserves among our fruitgrowers?

In an address before the New York State Agricultural society, in the winter of 1889, I heard Mr. HALE of Connecticut, a man whose success finds no cause of complaint even in the so-called "hard times" of today, argue that the currant was actually his most profitable fruit. With reasonable care, said he, an annual crop is assured, while the demand and prices are always satisfactory. Since then I have heard a similar statement from the ex-secretary of this society, Mr. C. W. GARFIELD. It is well, then, that more attention be paid to the culture of this fruit, and so I wish to offer some information that will prove helpful to those who may undertake currant culture, and will help to ward off failure or danger with those already engaged in the culture of this fruit.

In discussing the insect enemies of the currant, I need only refer to the ravages of the currant slug. *Nematus rabesii* Scop. Every pomologist knows that to grow currants he must fight this pest, and that dusting or spraying with hellebore or London purple is sure death to these ever recurring insects. I will only say in passing that there is a growing partiality among fruitmen in favor of the arsenites in this warfare, as a very dilute mixture, not stronger than one pound to 100 gallons of water, is a certain specific against these slugs. There is practically no danger in the use of this substance in the warfare. Certainly no danger in case of the first brood, which appears nearly as soon as the leaves; and if these early insects are thoroughly treated there will be little call to treat the second brood. Even if used on the second brood, this strength, one teaspoonful—all that will stay on a teaspoon if dipped into the powder—to five gallons of water, this is at the rate of one pound to 200 gallons of water—is really quite safe. If preferred, hellebore may be used, one ounce to two gallons of water or dusted on by use of bellows or Leggett's gun. In either case it is all-important to be very thorough. In case the bushes are treated while in blossom, the arsenites should never be used, on currants or any other fruit trees or shrubs the blossoms of which attract bees. In case of an early season, like the last, when such delay would result in considerable injury, hellebore should be employed.

CURRANT BORERS.

These enemies of the currant, though not so obvious as the slugs, are indeed serious enemies and must receive prompt attention or our currant vineyards will soon be things of the past. These work in the vines and so are entirely concealed from view, and so the fruitgrower knows nothing of danger till he sees his wilted bushes as dead stalks. We have found three species boring in the stems at the Agricultural college, and fortunately their habits are such that what will destroy one will exterminate all.

THE CURRANT ÆGERIAN.

This wasp-like moth, *Ægeria ipuliformis* Linn., has long been known. Indeed, I gave an illustrated description of it in the annual report of this society for 1875, page 143, and so will speak very briefly concerning it on this occasion. The moth is blue, wasp-like, with four narrow yellow cross lines on the abdomen. The wings are mostly transparent and



marked with brown veins. There is a heavy outer brown margin of the front and a narrow one of the back wings. A cross-line of the same color marks the primary wings one third their length from the tip. The moths are one half inch long and extend three fourths of an inch. The moths appear in June. The larva or caterpillar is white, hairy, and has some sixteen legs. It may be found in the stems from August to the following May. In May and June the light brown pupa may also be found in the hollow stalks. While these insects prefer the red currant, they attack and destroy both the black currant and the gooseberry. The remedy which I suggest, as it also applies to the other two borers yet to be destroyed, I will detail fully. It is no mere theory with me. I have proved its excellence and absolute efficacy and can assure all who give it a fair trial that it will not bring disappointment. The bushes should be permitted to sprout pretty freely in view of the ravages of this and other borers. In early May, before the leaves too much obscure the stalks, and before the insects have left their burrows, a careful examination should be made of all the stems. In case any stalk is dead at tip, it should be cut off below the dead portion. Special care should be taken to prune below the hollow cut by the borer, else we may fail of our purpose to secure all the insects in the pruned stems. These should all be burned. This work if carefully done, may be so thorough, as I have actually demonstrated, that not a moth shall be left to sow the seeds—or, better, lay the eggs—for future mischief. A few years ago I knew two very fine plantations of currants. Both were attacked by these currant ægerians. One of them I treated as detailed above, and today it is vigorous and very productive. The other was uncared for, and in two years hardly a vestige remained, but all was sacrificed to these hungry borers.

AMERICAN CURRANT BORER.

For the past two seasons we have found this beetle, *Psenocerus supernatus* Say, in the larva or grub state in the hollow currant stalks. The grubs are white, cylindrical, wrinkled, and footless. These are found in April and May. Thus we find these grubs and the ægerian caterpillars in hollow stalks at the same time. This past season we found these insects quite common, and certainly they are no mean enemy in the currant orchard. In early May we found the pupæ in the hollow stalks, and in late May and June the pretty, slim beetles came forth. These elegant little beetles vary exceedingly in size. We have them ranging from less than one eighth of an inch long to more than one quarter of an inch in length. The beetle is nearly cylindrical, the antennæ two thirds as long as the body. The general color is brown, which approaches to black on the posterior of the thorax and wing covers. The antennæ, a narrow front margin of the thorax, the base and

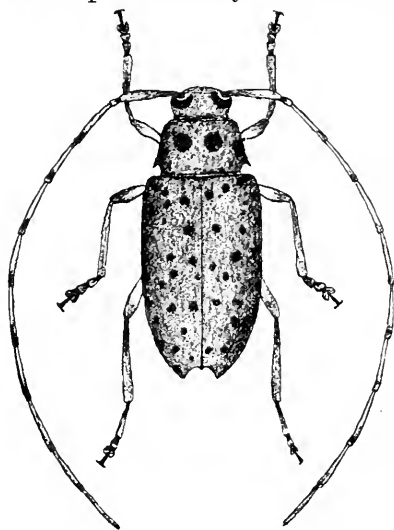


joined margins of the wing covers, are all a bright, lively brown. The scutellum and two spots on each wing cover are white. These spots divide each wing cover into three nearly equal parts. The anterior spots are small and occasionally double; the others are larger and crescent-shaped. Beneath, the insect is bright brown, and it is deeply punctured throughout, especially over the entire upper surface.

The same remedy that avails in ridding our currant stalks of the ægerian caterpillar will also banish this cerambycid grub. It only remains to urge that the vines be pruned early and so thoroughly that all the miners shall suffer cremation.

THE NEW CURRANT BORER.

The past season a new cerambycid borer, *Hyperplatys maculatus* Hald., whose place and style of work differs in no essential respect from the other



two currant borers, was discovered depredating upon this important plant. The beetle was first discovered as a currant borer by a post-graduate student of my laboratory, Mr. G. C. DAVIS. The following is in substance taken from Mr. DAVIS' thesis on borers: Like the other borers, so this species works in the upper portion of the stems. Riley speaks of this as a borer in apple twigs and Schwarz found it in twigs of poplar. The beetles, which come forth in June, are one fourth of an inch in length and one tenth of an inch in width. The antennæ are long and slender, about twice as long as the body. The color is gray, dotted with black. The head is smoky brown, with a longitudinal groove over the vertex and front. The eyes are transverse, rather finely granulated, and nearly divided by

the antennæ. The first joint of the antennæ is large, the second short and small, and both nearly black. The remaining joints are light brown, except at the tips, which are black. The thorax is not margined, and is broadest near its hind extremity, where a spine extends out and back on each side. Four black dots form a curved transverse row, convex anteriorly across the thorax. Each wing cover has from twenty to thirty-five black dots in four indistinct rows. These spots vary much in form and size. The hinder margins of the elytra are concave, with sharp angles. The elytra shows distinct lateral carinæ. The under parts are all dark gray, except the base of each femur, which is light brown.

The same remedy that banishes the ægerian and extirpates the American currant borer or grub, will also exterminate this new pest.

Thus we see that in this wise, judicious pruning of early May, we kill three birds with one stone, save our currants, and make possible jelly, jam, tarts, and jelly-cake.

SPRAYING FOR CURCULIO.

Prof. COOK was asked regarding one of his bulletins upon treatment of

curculio by means of the arsenites. He replied that further tests had tended to show that curculio can not be killed by spraying, at least not in sufficient numbers to make it a safe reliance. Jarring is the better method, because it is sure. A good substitute for a mallet, which is likely to injure trees, even when shielded with rubber, is to take an old clothes-wringer roller and put a handle part way through it. The rose chafer has been hard to kill, but at last we have him. Lime water (take unslaked lime enough to make the water milky white) sprayed on the trees or bushes will keep him off. Addition of two quarts or little more of carbolic acid to a barrel of the water would make it even better.

Mr. STEARNS: Great care must be taken in use of the acid. I use lime dust with carbolic acid to keep off curculio, and prefer lime to water because, in using the latter, the acid floats at first and settles to the bottom of the barrel at last; and so, going to the foliage undiluted, burns it.

Prof. COOK spoke of the mimicry by moths of wasps, which in great degree preserves them from the depredations of birds. He also remarked that the new currant borer, like the apple maggot, had previously worked upon something else, which had been removed and the insects forced to seek new food. The apple maggot is at first a pretty fly. In spring it pierces the skin of the apple and lays an egg which hatches and the larva bores all through the fruit. The maggot is found in fall apples chiefly, because of its time of hatching. The grower should get all such apples into beef and pork—apples are very valuable as food for stock. The maggots do not come out to pupate till the apple falls, so all are easily captured. When you find a tree infected, feed all the fruit upon it. Carbolic acid mixtures about trees will keep off the peach borer. So, probably, would tarred paper. The moths of the borers begin about July 1 and keep on through August. The borers found in September are from eggs laid in July. Those laid in August are not found till May. A good method is to apply about the trees ashes into which have been mixed carbolic acid.

The society finally adjourned, after receiving invitations to hold the July meeting in Port Huron and the next annual meeting in Eaton Rapids.

TWO LETTERS THAT WERE READ.

BENTON HARBOR, MICH., Nov. 21, 1890.

EDWY C. REID, Esq., *Secretary State Horticultural Society, Allegan, Michigan.*

People interested in raising peaches fully appreciate the importance of the peach yellows law and the necessity of rigidly enforcing the same. While there are many persons and much money invested in the attempt to grow peaches, there are not a few fruitgrowers also endeavoring to raise plums. The principal drawback met with by the latter is the disease known as black-knot. It is universally conceded by our best informed horticulturists that, to combat this disease with any hope of success, it is absolutely necessary that every branch be destroyed as soon as it is discovered to be attacked by black-knot. Merely cutting off the the affected part and throwing it on the ground will not answer the purpose. And we are informed that a tree affected with this disease is almost sure to affect others around it for a distance of half a mile or a mile. People living in sections of our state where the plum is raised, know that the commonest sights are plum trees literally covered with black-knot.

A man, trying to raise a few plums for his own use or for market, does not like to go around among his neighbors, criticising their infirmities or instructing them how to

carry on their business. Yet is it right or decent for one man to keep on his farm a nuisance or a pest that is injuring not only himself but his neighbor as well?

What the peach-grower has in the yellows law, the plum-grower wants in the shape of a black-knot law; and I must most respectfully and urgently suggest that this society take steps to have the proper petitions prepared, circulated, and presented to our next legislature, asking for the enactment of a law that shall add to or include in the operations of the peach yellows law, a provision that shall apply to black-knot in plum trees.

Such a change would not add greatly to the labor to be performed by the yellows commissioners, if they are merely required to include plum trees in their examinations.

A. J. KNISELY.

GLENWOOD, VOLUSIA COUNTY, FLA., Nov. 27, 1890.

EDWY C. REID, *Secretary Michigan State Horticultural Society*:

DEAR FRIEND—The programme of the winter meeting, to be held at Kalamazoo, has just reached me through your kindness. As I read the names of those who are prominent in the subjects to be discussed, it creates a strong desire to be present to meet them; but that is one of the impossibilities now.

This country has opened to me a wonderful field for horticultural work, for it is truly the home of the tree in almost all its unlimited variations.

That part of Florida known as the "hummock lands" abounds in a strange mixture of forest trees and shrubbery. There are several varieties of the hickory, a large number of the oak family prominent among which is the famed "live oak" in all its majesty and stateliness, the magnolia, the sweet gum, the cabbage palmetto, and in the lower or swampy places is the cypress in great quantity and large size. To all these may be added the large number of running and climbing vines, making a sort of jungle almost impassable.

The rolling or higher part of Florida is known as the "high pine." The timber is almost wholly pine of the tall, straight, "Georgia" or "pitch pine" variety. The trees are not thick and are limbless to a great height, so that one can see a long distance in any direction, and drive any distance he desires, regardless of road or any hindrance save occasionally a fallen tree or a little lake with a clean margin, of clear, clean, pure water.

Then, as one goes toward the coast, he finds the "flat woods," which are indeed flat and level, and covered with the same pine as found on the "high pine" land, and about as thick.

When northern people first came here, there was a belief that nothing could be grown except on the hummocks, which were very expensive to clear and subdue. But time has proved that the "high pine" is as profitable for orange culture as the hummocks and much cheaper in its preparation for the trees. I begin to have faith, however, that the "flat woods" are soon to become valuable for many crops and vegetables of all kinds.

Orange culture is now the ruling business in this part of the state, which is of the "high pine," and so profitable have the bearing groves become that many have not troubled themselves with any other crop except a few other fruits, such as guavas, peaches, pears, and plums, but buy all their vegetables, hay, and grain, which latter is brought in from the north.

Orange groves that have now got well to bearing are sure of a crop, seemingly, every year. Last winter was one of unusual drouth all over the state, and warm all through till the 2d of March, when there came a sort of blizzard from the northwest, followed that night with a severe frost in some localities. Then again, on the 17th, it was repeated with additional force. The outlook for an average crop was not inspiring, and many a long face could be seen. But the long drouth, so much lamented, proved to be a blessing, for most of the older trees had not put out the usual new growth for that time of year, but had remained in a sort of dormant state, with the last season's wood so hardened up that the frost did not hurt it. Soon afterward, light, warm rains set in, and out came the blossoms, and today there is the largest crop of fruit ever seen here. The young trees planted the summer before were cut down and some larger ones on damper soils had put out bloom and were damaged. A frost in March here is about as much of a surprise as it would be in July or August in Michigan.

The crop is now nearly ripe and will soon be ready to harvest. The oldest groves are from 15 to 17 years old and are now becoming very profitable. One neighbor has 20 acres that range from 8 to 16 years old. A buyer has just closed a bargain for the fruit "in a lump" on the trees, to be harvested and moved at his own expense, and

gives cash down \$8,500 for it. Another one has 22 acres of twelve-year-old trees, now well in bearing. He estimates his crop at 5,000 to 7,000 boxes, for which he is offered \$1.75 per box on the tree. A five-acre grove 10 years old has a crop estimated at 1,000 boxes; and so it goes, all over this part of the county.

The cost of making groves has been lessened very much in the last few years, from the improvements made in planting and handling young groves. It used to be said 10 years were required to bring a grove to a paying basis. Now there are many five-year-old groves that will pay expenses with the present crop.

New land is yet comparatively cheap but can not remain so long, especially that near the railways or river.

Yours truly,
S. B. MANN.

LIST OF PREMIUMS

AWARDED AT THE TWENTIETH ANNUAL FAIR OF THE SOCIETY, HELD
WITH DETROIT EXPOSITION, AUGUST 26 TO
SEPTEMBER 5, 1890.

FRUIT DEPARTMENT.

CLASS 67.—*General Collection of Fruits for Family Use.*

Most judiciously selected, best grown, most carefully handled general collection of fruits, affording an adequate set of varieties of each class, as far as practicable, for both dessert and culinary purposes, sufficiently mature at date of fair, collected and exhibited by the accredited representative of a society or grange—Lucas county (Ohio) Horticultural society, per W. W. Farnsworth, first; Mason county (Mich.) Horticultural society, by George C. McClatchie, second.

Most judiciously selected, best grown and most carefully handled general exhibit as above, grown by exhibitor—W. W. Farnsworth, Waterville, Ohio, first.

CLASS 70.—*Special Exhibit of Market Apples.*

Most judiciously selected, best grown, most carefully handled exhibit of five varieties of market apples, grown by the exhibitor, without regard to succession, productiveness, suitable size, handling qualities, satisfactory flavor, and general attractiveness to be the leading considerations—H. J. Clinton, Windsor, Ontario, first; T. E. Graham, per S. M. Pearsall, Grand Rapids, Michigan, second.

Most profitable, best grown, most carefully handled single peck of a variety of apples for market purposes, grown by the exhibitor—G. Truesdale, Whitmore Lake, Michigan, first; H. J. Clinton, Windsor, Ontario, second.

CLASS 72.—*Special Exhibit of Peaches.*

Most judiciously selected, best grown, most carefully handled exhibit of peaches, not less than 12 varieties, grown by the exhibitor, adapted to dessert and culinary purposes, and affording a succession throughout the usual season of this fruit, and sufficiently mature at this time—E. W. Smith, Catawba Island, Ohio, first.

Most judiciously selected, best grown, most carefully handled exhibit of eight varieties of peach for market purposes grown by the exhibitor, and affording a succession as far as practicable—E. W. Smith, Catawba Island, Ohio, first; W. H. Benedict, Birmingham, second.

Most profitable, best grown, most carefully handled exhibit of four varieties of peach for market, without regard to succession, grown by exhibitor—C. A. Sessions, Mears, Oceana county, Michigan, first; E. W. Smith, Catawba Island, Ohio, second.

Most profitable, best grown, and most carefully handled exhibit of single peck of a variety of peach for market, grown by exhibitor—E. W. Smith, Catawba Island, Ohio, (Foster) first; C. A. Sessions, Mears, Oceana county, (Hale's Early) second.

CLASS 73.—*Special Exhibit of Pears.*

Most judiciously selected, best grown, most carefully handled exhibit of pears for dessert or family and culinary purposes, not less than eight varieties, grown by

exhibitor, affording a succession down to date of fair—C. W. Counter, North Toledo, Ohio, first; H. J. Clinton, Windsor, Ont., second.

Most judiciously selected, best grown, most carefully handled exhibit of eight varieties of pear for market, with succession; grown by exhibitor—H. J. Clinton, Windsor, Ont., first; C. W. Counter, North Toledo, Ohio, second.

Most profitable, best grown, most carefully handled exhibit of one peck of a single variety of pears for market, grown by exhibitor—H. J. Clinton, Windsor, Ont., first; C. W. Counter, North Toledo, Ohio, second.

CLASS 74.—Special Exhibit of Plums, 12 Specimens of Each.

Most judiciously selected, best grown, most carefully handled exhibit of not less than ten varieties of plum for dessert or family and culinary purposes, affording a succession down to date of fair—C. A. Sessions, Mears, Oceana county, Mich., first; Mason, Ingham county (Mich.), Horticultural society, per Geo. C. McClatchie, second.

Most judiciously selected, best grown, most carefully handled exhibit of six varieties of plum for dessert or family and culinary purposes, grown by exhibitor, affording a succession down to date of fair—C. A. Sessions, Mears, Oceana county, Mich., first; Geo. C. McClatchie, Ludington, Mich., second.

Exhibit of most profitable, best grown, most carefully handled single peck of a variety of plum for market purposes, grown by exhibitor—H. J. Clinton, Windsor, Ont., first.

CLASS 75.—Special Exhibit of Grapes.

Most judiciously selected, best grown, most carefully handled exhibit of not less than eight varieties of native grape, grown in the open air by exhibitor, adapted to dessert and family purposes, and affording a succession down to date of fair—W. W. Farnsworth, Waterville, Ohio, first; D. G. Edmiston, Adrian, Mich., second.

Most judiciously selected, best grown, most carefully handled exhibit of four varieties of native grape for dessert and family purposes, grown in the open air by exhibitor, affording a succession throughout the usual season of this fruit—W. W. Farnsworth, Waterville, Ohio, first; Artimus Sigler, Adrian, Mich., second; D. G. Edmiston, Adrian, Mich., third.

Best collection of foreign grapes, grown under glass—Artimus Sigler, Adrian, Mich., first.

CLASS 76.—Apples—Single Plates.

SUMMER.

Early Joe—W. W. Farnsworth, Waterville, O., second.

Golden Sweet—Smith Hawley, Ludington, Mich., first.

Sweet Bough—Geo. C. McClatchie, Ludington, Mich., first.

Red Astrachan—A. Morton, Ludington, Mich., first; G. Truesdel, Whitmore Lake, second.

AUTUMN.

Chenango—N. Wilder, Ludington, Mich., first.

Gravenstein—G. Truesdel, Whitmore Lake, Mich., first.

Hawley—W. W. Farnsworth, Waterville, O., first.

Jersey—W. W. Farnsworth, Waterville, O., first.

Keswick—J. C. Lamb, Ludington, Mich., first.

Lowell—W. W. Farnsworth, Waterville, O., first.

Maiden's Blush—W. W. Farnsworth, Waterville, O., first; B. Mallory, Ludington, Mich., second.

Oldenburg—G. F. Piper, Ludington, Mich., first.

Twenty Ounce—W. W. Farnsworth, Waterville, O., first.

Ribston—G. Truesdel, Whitmore Lake, Mich., first.

Spice Sweet—G. Truesdel, Whitmore Lake, Mich., first.

St. Lawrence—H. J. Clinton, Windsor, Ont., first.

Fallwater—C. W. Counter, North Toledo, O., first.

Rambo—C. W. Counter, North Toledo, O., first.

Baldwin—C. W. Counter, North Toledo, O., first.

CRABS.

Hyslop—C. W. Counter, North Toledo, O., first.

Transcendent—Geo. C. McClatchie, Ludington, Mich., second.

CLASS 77.—*Pears—Single Plates.*

- Bartlett—W. W. Farnsworth, Waterville, Ohio, first; H. J. Clinton, Windsor, Ont., second.
- Boussock—Emil Baur, Ann Arbor, Mich., first; C. W. Counter, North Toledo, O., second.
- Buffum—W. W. Farnsworth, Waterville, Ohio, first; C. W. Counter, North Toledo, Ohio, second.
- Clapp—C. W. Counter, North Toledo, first; E. W. Smith, Catawaba Island, O., second.
- Doyenne d'Ete—Geo. C. McClatchie, Ludington, Mich., first; H. J. Clinton, Windsor, Ont., second.
- Flemish Beauty—C. W. Counter, North Toledo, Ohio, first; W. W. Farnsworth, Waterville, Ohio, second.
- Lucrative—Emil Baur, Ann Arbor, Mich., first; W. W. Farnsworth, Waterville, Ohio, second.
- Rostiezer—Emil Baur, Ann Arbor, Mich., first.
- Tyson—C. W. Counter, North Toledo, O., first; H. J. Clinton, Windsor, Ont., second.
- Sheldon—C. W. Counter, North Toledo, Ohio, first.
- Ott—C. W. Counter, North Toledo, Ohio, second.
- Onondaga—C. W. Counter, North Toledo, Ohio, first; Emil Baur, Ann Arbor, Mich., second.
- Superfine—C. W. Counter, North Toledo, Ohio, first; H. J. Clinton, Windsor, Ont., second.
- Figuier—C. W. Counter, North Toledo, Ohio, first.
- Urbaniste—C. W. Counter, North Toledo, Ohio, first.
- Seckel—C. W. Counter, North Toledo, Ohio, first.
- Kieffer—C. W. Counter, North Toledo, Ohio, first.
- Lawrence—C. W. Counter, North Toledo, O., first; Emil Baur, Ann Arbor, Mich., second.
- Anjou—C. W. Counter, North Toledo, O., first.
- White Doyenne—C. W. Counter, North Toledo, Ohio, first.
- Howell—C. W. Counter, North Toledo, Ohio, first.
- Angouleme—C. W. Counter, North Toledo, O., first; E. W. Smith, Catawba Island, O., second.
- Kirtland—C. W. Counter, North Toledo, O., first.
- Louise Bonne—C. W. Counter, North Toledo, O., first.
- Clairgeau—G. Truesdel, Whitmore Lake, Mich., first; H. J. Clinton, Windsor, Ont., second.
- Dearborn—Emil Baur, Ann Arbor, Mich., second.
- Glout Morceau—C. W. Counter, North Toledo, O., first.
- Lucrative—C. W. Counter, North Toledo, O., first.
- Winter Nellis—Emil Baur, Ann Arbor, Mich., first.
- Hardy—C. W. Counter, North Toledo, O., first.

CLASS 78.—*Peaches—Single Plates.*

- Crawford's Early—C. W. Counter, North Toledo, O., first; Emil Baur, Ann Arbor, second.
- Hale—Geo. C. McClatchie, Ludington, Mich., first; C. A. Sessions, Mears, Mich., second.
- Jacques—C. W. Counter, North Toledo, O., first; W. H. Benedict, Birmingham, Mich., second.
- Mountain Rose—W. W. Farnsworth, Waterville, O., first.
- Richmond—C. W. Counter, North Toledo, O., first.
- Red Cheek—C. W. Counter, North Toledo, O., first.
- Smock—C. W. Counter, North Toledo, O., first.
- Stump the World—C. W. Counter, North Toledo, O., first.
- Crawford's Late—C. W. Counter, North Toledo, O., first.

CLASS 79.—*Grapes—Single Plates.*

- Brighton—C. W. Counter, North Toledo, O., first.
- Delaware—D. G. Edmiston, Adrian, Mich., first.
- Duchess—W. W. Farnsworth, Waterville, O., first.
- Hartford—W. W. Farnsworth, Waterville, O., first.
- Lady—W. W. Farnsworth, Waterville, O., first; D. G. Edmiston, Adrian, Mich., second.

Moore—C. W. Counter, North Toledo, O., first; E. W. Smith, Catawba Island, O., second.

Niagara—W. W. Farnsworth, Waterville, O., first.

Prentiss—T. E. Graham, Grand Rapids, Mich., first.

Tallman—W. H. Benedict, Birmingham, Mich., first.

Worden—W. W. Farnsworth, Waterville, O., first; T. E. Graham, Grand Rapids, second.

Iona—Artimus Sigler, Adrian, Mich., first.

Clinton—C. W. Counter, North Toledo, O., first.

Concord—C. W. Counter, North Toledo, first.

Ives—C. W. Counter, North Toledo, first.

Elvira—C. W. Counter, North Toledo, first.

Champion—C. W. Counter, North Toledo, first.

Empire State—W. H. Benedict, Birmingham, Mich., first.

Wyoming—W. H. Benedict, Birmingham, first.

CLASS 80.—*Plums, Quinces, and Cranberries—Single Plates.*

Bradshaw—C. A. Sessions, Mears, Michigan, first.

Damson—E. W. Smith, Catawba Island, Ohio, first; C. A. Sessions, Mears, Mich., second.

Green Gage—Charles Grant, Thornbury, Ontario, first.

Jefferson—Charles Grant, Thornbury, Ontario, first.

Lombard—E. W. Smith, Catawba Island, Ohio, first; C. W. Counter, North Toledo, Ohio, second.

Monroe—Geo. C. McClatchie, Ludington, Mich., first; G. Truesdel, Whitmore Lake, Mich., second.

Quackenboss—G. Truesdel, Whitmore Lake, Mich., first.

Red Egg—Charles Grant, Thornbury, Ontario, first.

Shropshire—W. W. Farnsworth, Waterville, Ohio, second.

Smith's Orleans—E. W. Smith, Catawba Island, Ohio, first.

Union Purple—E. W. Smith, Catawba Island, Ohio, first.

Washington—C. A. Sessions, Mears, Mich., first; Charles Grant, Thornbury, Ont., second.

Yellow Egg—E. W. Smith, Catawba Island, Ohio, first.

Princess—C. A. Sessions, Mears, Mich., first.

Sugar Plum—G. Truesdel, Whitmore Lake, Mich., first.

Bavay—Emil Baur, Ann Arbor, Mich., first.

Shaw—C. W. Counter, North Toledo, Ohio, second.

German Prune—W. W. Farnsworth, Waterville, Ohio, first.

General Hand—C. A. Sessions, Mears, Mich., first; Charles Grant, Thornbury, Ont., second.

Pond's Seedling—C. A. Sessions, Mears, Mich., first.

Orange Quince—H. J. Clinton, Windsor, Ont., first; C. W. Counter, North Toledo, Ohio, second.

Champion—C. W. Counter, North Toledo, Ohio, first.

CLASS 81.—*Dried, Canned, Pickled, Preserved Fruits and Jellies.*

Best 10 classes of named varieties of domestic dried fruits, product of any one family or individual—Mrs. H. C. Forbes, Kalamazoo, Mich., first.

Best 12 classes of named varieties of domestic canned fruits, product of one family or individual—Mrs. O. E. Bartlett, Pontiac, Mich., first; Mrs. H. C. Forbes, Kalamazoo, Mich., second; Mrs. Ella Reynolds, Greenfield, Mich., third; Artimus Sigler, Adrian, Mich., fourth.

Best eight classes of named varieties of domestic preserved fruits, product of one family or individual—Mrs. H. C. Forbes, Kalamazoo, Mich., first; Mrs. O. E. Bartlett, Pontiac, Mich., second; Mrs. C. W. Crandall, Kalamazoo, Mich., third; Miss Sarah Fletcher, Ann Arbor, Mich., fourth.

Best 10 classes of named varieties of domestic jellies, product of one family—Mrs. H. C. Forbes, Kalamazoo, Mich., first; Miss Sarah Fletcher, Ann Arbor, Mich., second; Mrs. O. E. Bartlett, Pontiac, Mich., third; Mrs. C. W. Crandall, Kalamazoo, Mich., fourth.

CLASS 82.—*Collections of Tropical and Sub-Tropical Fruits.*

Fruiting Plant of Banana—S. B. Mann, Glenwood, Florida, first.

Fruiting Plant of Pineapple—S. B. Mann, Glenwood, Florida, first.

Fruiting Plant of Orange Tree—Grown out of doors—S. B. Mann, Glenwood, Florida, first.

FLORAL DEPARTMENT.

CLASS 83.—*Plants and Flowers, in Beds.*

Ribbon Bed of Flowers, to occupy not less than fifty square feet, to be entirely filled with flowers so as to illustrate ribbon beds in garden or lawn—Chas. Warncke, Woodmere, Mich., first; B. Shroeter, Elmwood avenue, Detroit, second.

Bed of Ornamental Foliage Plants, not less than fifty square feet—B. Shroeter, Elmwood avenue, Detroit, first.

Design for Lawn Flower Bed, to cover not less than fifty square feet—B. Shroeter, Elmwood avenue, Detroit, first.

CLASS 84.—*Plants in Pots.*

Collection of Hot-house Plants, not less than 30 varieties—B. Shroeter, Detroit, Mich., first; John Breitmeyer & Son, Detroit, Mich., second; F. Schneider, Detroit, Mich., third.

Collection of Foliage Begonias, not less than five varieties—John Breitmeyer & Son, Detroit, first; S. Taplin, Detroit, second; Fr. Schneider, Detroit, third.

Collection of Tuberous Begonias, not less than five varieties—Carl Bogula, Detroit, first; Fr. Schneider, Detroit, second.

Collection of Flowering Begonias, ten or more, in bloom—S. Taplin, Detroit, first; Charles Warncke, Woodmere, Mich., second; Carl Bogula, Detroit, third.

Collection of Begonia Rex, 12 or more plants—Charles Warncke, Woodmere, first; Fr. Schneider, Detroit, second.

Collection of Double Geraniums, different colors, in bloom, in not less than six-inch pots—Fr. Schneider, Detroit, first; Carl Bogula, Detroit, second; Charles Warncke, Woodmere, third.

Collection of Single Geraniums, different colors, in bloom, in not less than six-inch pots—Carl Bogula, first; Fr. Schneider, second.

Collection of Asters, not less than 15 plants—Fr. Schneider, first; B. Shroeter, Detroit, second.

Collection of Coleus, 12 or more varieties—Charles Warncke, Woodmere, first; Carl Bogula, Detroit, second.

Collection of Coleus, five or more varieties—Charles Warncke, Woodmere, first; Carl Bogula, second.

Collection of Fancy Foliage Geraniums—Charles Warncke, first; Carl Bogula, second.

Collection of Calendulas and Marigolds, not less than 15 plants—Carl Bogula, first; John Breitmeyer & Son, second.

Lilium Rubrum, single specimen—Fr. Schneider, first.

Single plant of merit, India Rubber tree—Fr. Schneider, first.

Lawn Vase filled—Carl Bogula, first; Charles Warncke, second.

Hanging Basket—Carl Bogula, first; Fr. Schneider, second.

Hanging Plants, five or more kinds—Charles Warncke, first; Carl Bogula, second.

Collection of Crotans, 12 plants, six varieties—S. Taplin, first.

Collection of Crotans, small—S. Taplin, first.

Single Crotan—S. Taplin, first.

Collection of Marantas, 12 plates, six varieties—S. Taplin, first.

Single Maranta—S. Taplin, first.

Collection of Dræcenas, 12 plants, six varieties—S. Taplin, first.

Single Dræcena—S. Taplin, first.

Pair of Green Agaves—S. Taplin, first.

Pair of Variegated Agaves—S. Taplin, first.

Single Agave—S. Taplin, first; Charles Warncke, second.

Collection of Medicinal and Commercial Plants, 12 plants, six varieties—S. Taplin, first.

Single specimen of above—S. Taplin, first.

Collection of Greehouse and Hothouse vines—S. Taplin, first.

Single vine—S. Taplin, first.

Collection of Small Ferns—S. Taplin, first.

Orange Tree in fruit—E. Farrand, first; Charles Warncke, second.

Group of Laurocerasus—E. Farrand, first.

Ligustrum Coriaceum—E. Farrand, first.

Collection of New Zeland Flax—E. Farrand, first.

Collection of Blue Hydrangeas—E. Farrand, first.

Six Dræena Indivisa—E. Farrand, first.

Acuba Japonica—E. Farrand, first.
 Hydrangea, Thomas Hogg—E. Farrand, first.
 Japanese Bamboos—E. Farrand, first.

AMATEUR LIST.

Ten or more house plants, different species—John H. Murrer, Detroit, first.
 Six varieties Ornamental Foliage Plants for garden—John H. Murrer, first.
 Six varieties, different colors, of Single Flowering Geraniums—John H. Murrer, first.
 Six varieties, different colors, of Double Flowering Geraniums—John H. Murrer, first.
 Six Coleus, named varieties—John H. Murrer, first.
 Fuchsia, single plant—D. L. Williams, Detroit, first.
 Wax Plant—D. L. Williams, first.

CLASS 85.—*Cut Flowers, Bouquets and Floral Designs.*

Display of Cut Flowers—Charles Warncke, Detroit, first; John Breitmeyer & Son, Detroit, second.
 Twelve varieties of Verbena, different colors—Carl Bogula, first; Andrew Ferguson, Detroit, second.
 Twelve Gladioli, different colors—John Breitmeyer & Son, first; Carl Bogula, second.
 Collection of Gladioli, 25 or more varieties—John Breitmeyer & Son, first; B. Schroeter, Detroit, second.
 Collection of Pansies, 20 or more colors—B. Schroeter, first; Charles Warncke, Woodmere, second.
 Collection of Carnations, 10 or more colors—Andrew Ferguson, first; John Breitmeyer & Son, second.
 Bouquet, arranged by exhibitor—Andrew Ferguson, first; Carl Bogula, second.
 Floral design, arranged by exhibitor, in living flowers—B. Schroeter, first; John Breitmeyer & Son, second.
 Basket of Cut Flowers, arranged by exhibitor—John Breitmeyer & Son, first; Carl Bogula, second.
 Arrangement of flowers for table—John Breitmeyer & Son, first; Carl Bogula, second.
 Mignonette, 50 or more spikes—Carl Bogula, first.
 Collection of Asters, 100 or more blooms, 20 or more variations of color—Fr. Schneider, Detroit, first; B. Schroeter, second.
 Largest and best display of orchids—Pitcher & Manda, Short Hills, N. J., first.
 Collection of Asters, 50 or more blooms, 10 or more variations of color—John Breitmeyer & Son, first; Fr. Schneider, second.
 Collection of Phlox Drummondii, not less than 100 clusters—Carl Bogula, first; Chas. Warncke, second.
 Collection of Perennial Phlox, 10 or more variations, 25 or more clusters—John Breitmeyer & Son, first.
 Collection of Petunias, double—Carl Bogula, first; Fr. Schneider, second.
 Collection of Petunias, single—Carl Bogula, first; Fr. Schneider, second.
 Collection of Chinese or Japanese pinks, 12 or more varieties, five or more of each—Fr. Schneider, first.
 Collection of Balsams, 12 or more colors, 10 or more blooms of each, on branches—Carl Bogula, first.
 Collection of Roses, grown indoors, not less than six varieties and 25 specimens—John Breitmeyer & Son, first.
 Collection of Roses, grown outdoors, not less than six varieties and 25 specimens—John Breitmeyer & Son, first.
 Twelve Bride Roses—John Breitmeyer & Son, first; Andrew Ferguson, second.
 Twelve Catherine Mermet Roses—Andrew Ferguson, first; John Breitmeyer & Son, second.
 Twelve La France Roses—John Breitmeyer & Son, first.
 Twelve Marechal Niel Roses—John Breitmeyer & Son, first.
 Twelve Niphetos Roses—John Breitmeyer & Son, first; Andrew Ferguson, second.
 Twelve Perle des Jardins Roses—Andrew Ferguson, first; John Breitmeyer & Son, second.
 Twelve Sunset Roses—John Breitmeyer & Son, first.
 Twelve Roses, any other approved variety—John Breitmeyer & Son, first.
 Dwarf Sunflower, 50 or more blooming stems—B. Schroeter, first.
 Collection of Japan Lilies, not less than three kinds, two or more stalks of each—John Breitmeyer & Son, first.

- Lilium Auratum, single specimen—John Breitmeyer & Son, first.
 Lilium Rubrum, single specimen—Fr. Schnieder, first; John Breitmeyer & Son, second.
 Lilium Album, single specimen—John Breitmeyer & Son, first.
 Mantel Decoration—John Breitmeyer & Son, first.

CLASS 86—*Garden Vegetables, Roots, Herbs, and Seeds.*

- General collection of vegetables for family use, grown by market gardener—C. J. Engel, Woodmere, Mich., first; Beard Bros., Detroit, second.
 General collection of vegetables for family use, grown by farmer or amateur, Whipps Bros., Marion, O., first.
 Most artistic arrangement of vegetables grown by farmer—Whipps Bros., first.
 Most artistic arrangement of vegetables, grown by market gardener—Beard Bros., first.
 Collection of potatoes, grown by exhibitor, 15 or more varieties, six of each—Whipps Bros., first; A. W. Jewett, Mason, Mich., second.
 Peck of named variety of potatoe, early, Beauty of Hebron—G. Truesdel, Whitmore Lake, Mich., first; Beard Bros., second.
 White Elephant—L. Ford, Greenfield, Mich., first; F. T. Hall, Detroit, second.
 Early Ohio—Whipps Bros., first; Beard Bros., second.
 Beard Bros., first, on peck of Early Rose, Geo. B. McClelland, Chicago Market, Magnum Bonum, Proctor, Snowflake, Monroe Seedling, Early Sunrise, Early Chicago, Ohio Farmer, White Rose, Green Mountain, Burbank, Queen of the Valley, Empire State, White Star.
 Peck of table turnips, white—Whipps Bros., first; Beard Bros., second.
 Half bushel of stock turnips or bagas—Whipps Bros., first.
 Collection of onions, five or more varieties, one peck of each—C. J. Engel, first.
 Peck of onions, red—C. J. Engel, first; Beard Bros., second.
 Peck of onions, white—C. J. Engel, first; Beard Bros., second.
 Peck of onions, yellow—Whipps Bros., first; C. J. Engel, second.
 Collection of carrots, five or more varieties, one peck each—C. J. Engel, first; Beard Bros., second.
 Peck of carrots for table use—Oscar B. Marx, Detroit, first; C. J. Engel, second.
 Peck of carrots for stock—C. J. Engel, first; Oscar B. Marx, second.
 Collection of beets, five or more varieties, one peck of each—C. J. Engel, first; Beard Bros., second.
 Peck of beets for table use—Oscar B. Marx, first; Whipps Bros., second.
 Six beets for stock—C. J. Engel, first.
 Swiss Chard—Whipps Bros., first; C. J. Engel, second.
 Collection of cabbages, five or more varieties, three of each—C. J. Engel, first; Beard Bros., second.
 Six early cabbages, any named sort—C. J. Engel, first; Beard Bros., second.
 Beard Bros., first on six cabbages each of Jersey Wakefield, Stumps, Bleitchfield Early Grant and Early Express.
 Six late cabbages, any named sort—Beard Bros., first; C. J. Engel, second.
 Six late cabbages, White Star—Beard Bros., first.
 Six Savoy cabbages—Beard Bros., first; C. J. Engel, second.
 Largest and heaviest head of cabbage—C. J. Engel, first; Beard Bros., second.
 Six red cabbages—C. J. Engel, first; Beard Bros., second.
 Six heads Brussels sprouts—H. G. Stillman, Almond, N. Y., first.
 Twelve roots of chicory—Beard Bros., first; H. G. Stillman, second.
 Peck of parsnips—C. J. Engel, first; Beard Bros., second.
 Six Kohl Rabi—H. G. Stillman, first; Whipps Bros., second.
 Watermelon, single variety, named—Oscar B. Marx, first.
 Muskmelon, single variety, named—Oscar B. Marx, first.
 Collection of nutmeg muskmelons, three or more varieties, yellow flesh, three of each—Whipps Bros., first; Beard Bros., second.
 Six citrons—John McLane, Grosse Point, Mich., first.
 Peck of wax beans, in pod—C. J. Engel, first; Whipps Bros., second.
 Peck of green string beans, in pod—C. J. Engel, first; Whipps Bros., second.
 Collection of celery, six or more named varieties—M. Wetterling, Ionia, Mich., first.
 Collection of celery, two or more varieties of self-bleaching—Beard Bros., first; M. Wetterling, second.
 Bunch of celery, large sort—Beard Bros., first.
 Bunch of celery, dwarf sort—Beard Bros., first.
 Six heads cauliflower—Oscar B. Marx, first; C. J. Engel, second.

- Six bunches kale—C. J. Engel, first; Beard Bros., second.
- Collection of squashes, winter and summer, six varieties of each—C. J. Engel, first.
- Six summer squashes—Beard Bros., first; C. J. Engel, second.
- Six Hubbard squashes—Oscar B. Marx, first; Beard Bros., second.
- Six winter squashes, any other kind—Oscar B. Marx, first; Beard Bros., second.
- Heaviest winter squash—C. J. Engel, first; Oscar B. Marx, second.
- Collection of Stove Plants, not less than 30 varieties—S. Taplin, Detroit, first; John Breitmeyer & Son, Detroit, second.
- Collection of Palms, not less than 12, in 5 varieties—John Breitmeyer & Son, Detroit, first; S. Taplin, Detroit, second; E. Ferrand, Detroit, third.
- Collection of Palms in eight-inch pots or less—John Breitmeyer & Son, Detroit, first; E. Ferrand, Detroit, second; S. Taplin, Detroit, third.
- Single Palm—S. Taplin, Detroit, first; John Breitmeyer & Son, Detroit, second.
- Collection of Ferns, not less than 10 varieties—John Breitmeyer & Son, Detroit, first; S. Taplin, Detroit, second.
- Single Fern—John Breitmeyer & Son, Detroit, first; S. Taplin, Detroit, second.
- Collection of Orchids, five varieties, in bloom—S. Taplin, Detroit, first.
- Collection of Fancy Caladiums, not less than five varieties—John Breitmeyer & Son, Detroit, first.
- Collection of Fuchsias, in not less than ten-inch pots, ten or more, single or double—F. Schneider, Detroit, first; Carl Bogula, Detroit, second.
- Collection of Tuberoses, 12 or more blooming plants—Carl Bogula, Detroit, first; Fr. Schneider, Detroit, second.
- Collection of sweet corn, five or more varieties, named—C. J. Engel, first.
- Most desirable single variety sweet corn, six ears—Whipps Bros., first; S. Ford, Greenfield, Mich., second.
- Collection of peppers, six or more kinds, named, six of each—C. J. Engel, first; Beard Bros., second.
- Six peppers, single variety, named—C. J. Engel, first; Beard Bros., second.
- Peck of salsify—Beard Bros., first; Whipps Bros., second.
- Six heads of lettuce—Oscar B. Marx, first; C. J. Engel, second.
- Collection of tomatoes, named varieties, illustrating the modern improvement of this esculent—Beard Bros., first.
- Collection of five or more varieties of tomato for market, five of each, named—Beard Bros., first; C. J. Engel, second.
- Peck of tomatoes, most desirable market sort—Beard Bros., first; Whipps Bros., second.
- Display of parsley—Beard Bros., first; H. G. Stillman, Almond, N. Y., second.
- Peck of green cucumbers, long—Beard Bros., first; Oscar B. Marx, second.
- Peck of green cucumbers, short—Beard Bros., first.
- Largest cucumber, green or ripe—Whipps Bros., first; Otto B. Kurthe, Detroit, second.
- Six winter radishes—Beard Bros., first.
- Peck of spinach—C. J. Engel, first; Beard Bros., second.
- Ten pods okra—Beard Bros., first.
- Three field pumpkins—Beard Bros., first; John McLean, Grosse Point, second.
- Collection of egg plant (fruit), four or more varieties, three of each—C. J. Engel, first.
- Three egg plants (fruit)—C. J. Engel, first; Beard Bros., second.
- Collection of radishes, six or more varieties, named—C. J. Engel, first.
- Collection of culinary herbs and seeds, 10 or more varieties, named—Oscar B. Marx, first.

BULLETINS

OF

MICHIGAN AGRICULTURAL EXPERIMENT STATION

ISSUED IN 1890

HAVING REFERENCE TO HORTICULTURAL AFFAIRS.

EXPERIMENT STATION BULLETINS.

FRUIT-TESTING AT THE SOUTH HAVEN SUB-STATION.

By T. T. LYON—Bulletin No. 67, Horticultural Department.

In the spring of 1888 the Board of Agriculture authorized an arrangement with T. T. LYON, by which the station secured a report upon the fruits growing on his extensive experimental plantation at South Haven.

The report was issued as Bulletin No. 55, and was so well received that at the urgent solicitation of the fruitgrowers of the "fruit belt" it was determined to place the work on a more permanent basis.

The people of South Haven donated a tract of land adjoining that of President LYON, and future plantings of trial fruits will be made on it. As some time must elapse before results can be obtained from the station trees, the use of the Lyon tract was secured, and from the plants growing thereon the following report was prepared by President LYON, whose services we were fortunate enough to secure to carry on the work.

AGRICULTURAL COLLEGE, MICH., }
October 16, 1890.

L. R. TAFT,
Horticulturist.

To Prof. L. R. Taft, Horticulturist, Experiment Station:

SIR—The fruiting season of the strawberry, at this place, for the current year, being now past, the following report is submitted:

The plat from which the following particulars have been deduced, was planted, in the spring of 1889, with primary reference to the growth of plants and fruit for sale, it being at the time deemed improbable that occasion would occur for their employment for experimental purposes.

Arrangements having been subsequently effected for such purpose, ten feet in length were measured off upon a matted row of each variety prior to the digging of plants for the spring sale. These several reserved plats were reduced to a common width of eight inches; and, in case of a light stand of plants, the lack was supplied by increasing the length.

On each "picking day" these several plats were each picked separately, and the date and weight, in ounces, of each picking recorded, the sum of

the weights of these several pickings from each plat expressing the relative productiveness of the variety for the year.

The past winter and spring have tested the comparative hardness of varieties more severely than usual. Many of those usually thought to be lacking in this particular, such as Anna Forest, Henderson, Jewell and a few others were nearly or quite ruined, while others not usually considered deficient in hardness, have so far suffered as, in a greater or less degree, to affect the quality or quantity of their yield of fruit. Among such we may mention Cornelia, Crimson Cluster, Gold, Goldsmith, Hoffman, Longfellow, Prince of Berries, Sucker State and perhaps others. This fact, will have, doubtless, in some degree affected the results given, but to what extent seems only determinable from the results of repeated trials.

For several weeks prior to the picking season, the conditions had been favorable to the development of size and quantity of fruit, while the advent of excessively hot, drying weather hastened and shortened the ripening season, deteriorating the size and probably occasioning the abortion of many of the later specimens, which, with the prevalence of more favorable weather, would probably have matured.

The following tabulation is extended across two opposite pages, the connection being indicated by the use of numbers.

The form and color of the fruit, together with the prevalence of fungi, are given by means of abbreviations placed at the head of the table.

Insects have not, so far, proved troublesome. Several years since the leaf-roller (*Phoxopteris fragariae*, W. & R.) became very abundant. As the larva invariably draws the opposite halves of the leaflet closely together, its presence is readily observable. Advantage was taken of this circumstance to crush the larvæ in these hiding places, which was so thoroughly done that very few appeared the following season. The same process was applied to these, since which they have almost wholly disappeared.

The dates of origination or introduction are, in most cases, to be considered as mere approximations, many of them having been inferred from the dates of introduction, or from recollection of our first acquaintance with the variety.

The column headed "Hardiness" indicates the condition in which the plants came through the past winter, which, in a few cases, may have been in some degree affected by local peculiarities of soil, and possibly in a few instances by their previous condition.

For the reasons stated, the results given under the head of "Productiveness" to some extent need a repetition of the trial, in other seasons and soils, before being accepted as conclusive.

STRAWBERRIES.

ABBREVIATIONS FOR THIS SECTION.

Form. b. broad or compressed. i. irregular r. roundish. l. long. b. bright. l. light. r. red.
 d. depressed or oblate. o. oval or ovate. c. conical c. crimson. d. dark. s. scarlet.

Number.	Name.	Plant.									
		Sexuality.	Place of Origin.	Time of Origin.	Earliest Bloom.	First Ripe Fruit.	Last Picking.	Vigor, Scale 1 to 10.	Hardiness, 1 to 10.	Productiveness, in ounces.	Fungl.
1	Alpha	B	Ont.	1881	May 14	June 15	June 25	8	10	25	b
2	Anna Forest	B	N. J.		" 26			5	3	0	b
3	Arnold's Pride	B	Ont.	1881	" 22	June 20	July 2	8	9	44	b
4	Belmont	B	Mass.	1880	" 25	" 23	" 3	9	9	56	c
5	Bidwell	B	Mich.	1872	" 18	" 16	June 25	9	10	25	a
6	Black Defiance	B	N. J.		" 21	" 18	" 27	10	10	28	c
7	Bomba	B	N. J.	1880	" 22	" 18	" 30	9	8	50	d
8	Boyden's 30	B	N. J.	1870	" 24	" 23	" 27	9	8	18	b
9	Bright Ida	B	Ont.	1881	" 21	" 18	July 2	9	9	57	d
10	Bubach's No. 5	B	Ill.	1885	" 25	" 18	" 2	10	10	80	a
11	Burt	B	N. Y.	1887	" 26	" 18	" 3	9	10	75	b
12	Captain Jack	B	Mo.	1874	" 22	" 18	" 3	10	10	68	c
13	Champion	P	Pa.	1872	" 22	" 20	" 3	6	7	52	c
14	Charles Downing	B	Ky.	1860	" 22	" 20	" 2	9	10	27	c
15	Cheney	P	N. Y.	1872	" 19	" 18	June 27	4	6	38	a
16	Cloud	P	La.	1887	" 22	" 18	" 30	9	10	74	b
17	Cornelia	B	Ohio.	1882	" 24	" 27	" 30	3	3	3	b
18	Covell	B	N. J.	1886	" 21	" 16	" 23	7	6	26	d
19	Crawford	B	Ohio.	1887	" 26	" 20	July 2	9	10	43	b
20	Crescent	P	Conn.	1870	" 21	" 16	June 27	9	10	51	b
21	Crimson Cluster	P	N. J.	1882	" 30	" 23	" 27	6	5	11	b
22	Cumberland	B	Pa.	1874	" 24	" 20	July 2	9	9	58	c
23	Dew	B	Mich.	1876	" 28	" 25	" 2	10	10	52	b
24	Duncan	B			" 24	" 18	" 3	10	10	85	d
25	Earle	B	Texas.	1886	" 24	" 23	June 30	6	8	10	b
26	Eureka	P	Ohio.	1881	" 28	" 27	" 30	8	9	12	a
27	Fairy	P			" 22	" 23	July 2	5	7	24	c
28	Florence	B	Ohio.	1888	" 24	" 18	June 30	10	10	26	a
29	Galceron	B	Ga.	1892	" 25	" 20	July 2	6	9	38	c
30	Gandy	B	N. J.	1885	" 27	" 25	" 2	9	10	19	d
31	Garrettson	P			" 25	" 23	" 2	7	9	38	b
32	Gipsev	P			" 18			8	10	0	b
33	Glendale	B	Ohio.	1871	" 24	June 23	June 27	9	10	20	d
34	Gold	P	Conn.	1884	" 26			5	2	0	a
35	Goldsmith	B	Ohio.	1877	" 22	June 27	June 27	7	3	6	b
36	Hampden	P	Mass.	1884	May 24	June 20	June 30	8	8	40	c
37	Haverland	P	Ohio.	1884	" 16	" 16	July 2	8	9	61	b
38	Henderson	B	N. J.	1880	" 25			8	1	0	a
39	Hoffman	B	Ind.	1885	" 23			8	2	0	b
40	Indiana	B	Ind.	1875	" 26	June 23	July 2	8	9	29	b
41	Itasca	P	Ind.	1886	" 21	" 18	June 27	8	10	42	a
42	Jessie	B	Wis.	1885	" 23	" 20	July 2	9	9	39	b
43	Jewell	P	Conn.	1882	" 27	" 20		4	3	0	a
44	Jucunda	B	Belg.	1855	" 26			2	3	0	b
45	Kentucky	B	Ky.		" 28	June 23	June 30	10	10	14	b
46	Lady Rusk	P	Ill.	1887	" 20	" 20	" 30	9	10	50	a
47	Lida	P	N. J.	1883	" 25	" 20	" 25	4	4	13	d
48	Little's No. 10	B	Ont.	1887	" 21	" 20	" 30	9	10	38	a
49	Logan	B	Ind.	1886	" 23	" 20	" 30	9	9	42	a
50	Longfellow	B	Ky.	1876	" 24			7	1	0	b
51	Louden's No. 15	B	Wis.	1887	" 24	June 23	June 27	10	10	16	a
52	Louise	B	N. Y.	1888	" 26	" 20	" 30	9	9	58	d
53	Maggie	B	Ont.	1881	" 19	" 18	July 3	8	9	55	b
54	Mammoth	B	N. J.	1886	" 24	" 20	June 25	7	9	12	c
55	Manchester	P	N. J.	1876	" 24	" 23	" 30	7	9	45	c

STRAWBERRIES.—CONTINUED.

ABBREVIATIONS—Continued.

Fungi (*Spizicrella fragariae* Sacc.)a. clear.
b. slightly spotted.c. much spotted.
d. very badly spotted.e. general discoloration from
whatever cause.B. bisexual.
P. pistillate.

Number.	Fruit.					Remarks.
	Size, Scale 1 to 10.	Quality, 1 to 10.	Firmness, 1 to 10.	Form.	Color.	
1	4	8	4-5	o c	1 r	Best and most prolific of the very early varieties.
2	7	7	3-4	c	b s	Plant not hardy. Of little value.
3	8	8	7-8	1 c	1 r	Excellent for the home. Too pale for market.
4	8	10	6-8	1 o	b s	Valuable under high culture.
5	8-9	9	7-8	1 c	b c	To be productive, should be grown in hills.
6	8-9	8	9-10	r b	d c	Very old, but still worthy.
7	9-10	8	4-5	c	c	A seedling of Crimson Cluster.
8	7	8	6-7	r c	d c	Still a good amateur variety.
9	8	8	7-8	r b c	1 r	Color not bright enough for market.
10	10	6	6	r b d c	b c	Very desirable, for a near market.
11	6	7	9	r d c	d r	Proves to be a distinct variety.
12	5	6	9	r c	b c	Fruit abundant, but lacks size.
13	5	5	8-9	r c	d c	Still occasionally planted for market.
14	6	7	5-6	r c	d s	Old, but still prized by many planters.
15	7	8	5-6	r b c	b c	Plant lacks vigor, nearly superseded.
16	7	9	9-10	r	d r	Vigorous, hardy and very prolific.
17	8	9	8-9	r c	d s	Plant lacks vigor. Unprofitable.
18	4-7	9	9	r	d c	Fails to mature the later berries. Needs high culture.
19	10	9	9	r c	b r	Most of the fruit was from runners of last year.
20	7	6	6	r c	b c	Very prolific of both plants and fruit.
21	5-6	9	6	d c	d c	Fine flavor. Very unproductive.
22	10	7	6	d r c	1 c	Even sized, and always perfect in form.
23	10	7	10	b r c	d s	Plant very vigorous. Fruit enormously large.
24	8	9	7	c	d r	A very old variety; now seldom planted.
25	5	8	4	o	b c	A Texas variety. Not valuable.
26	8	7	7-8	r c b	d c	A poor stand of plants, for this season.
27	4	5	3	r	1 c	Not valuable, except as a curiosity.
28	6	7	8	r c	b c	Plant healthy. Promising for market.
29	5	9	9	r c b	d r	Received from Northern Georgia. Popular there.
30	9	9	8	r c b	d c	One of the best of the late varieties.
31	5	5	6	r c	c	Not valuable as compared with many others.
32	5	6	4	r c	1 r	Not valuable here.
33	8	7	7	1 c	d c	Like most late varieties, lacks productiveness.
34	7	9	7	r	d c	A good family berry; but requires high culture.
35	10	9	8	o c	b c	The later berries are often small and imperfect.
36	9	9	8	o	b r	A rather light stand of plants.
37	8	7-8	6	1 c	s	Perfect in form, even sized, profitable.
38	6	10	8	o c	c	Plant not hardy. Quality excellent.
39	4	8	8	r	d r	Esteemed by Maryland growers.
40	5	6	6	c	1 c	Scarcely productive enough for market.
41	7	7	6	r	c	Has not realized its early promise.
42	10	6	7	r c b	d c	Does not stand as high as had been anticipated.
43	9	6	7	r c i	b c	Not a sure producer of either fruit or plants.
44	8	5	9	r c	b s	Needs strong land, and hill culture.
45	7	6	7	1 c	b s	An old variety. Late market.
46	8	7	7	r c	b c	A vigorous, healthy plant. A market berry.
47	7	7	4	r c	b c	Sets more fruit than it can mature.
48	9	8	8	r d c	b c	This requires another season's trial.
49	7	7	5	r d c	b c	A good market variety.
50	9	6	6	1 c	c	First fruits large. Later ones imperfect.
51	10	8	7	b r c	c	This needs another season's trial.
52	9	8	6	1 o c	1 c	An attractive market variety.
53	7	8	6	r o i	1 s	Lacks brightness of color for market.
54	10	7	5	1 c r b	b c	First fruits very large. Later ones small.
55	8	8	9	r d c	c	The plant exhausts itself by overbearing.

STRAWBERRIES.—CONTINUED.

Form. Color.
b. broad or compressed. i. irregular. r. roundish. l. long. b. bright. l. light. r. red.
d. depressed or oblate. o. oval or ovate. c. conical. c. crimson. d. dark. s. scarlet.

Number.	Name.	Plant.									
		Sexuality.	Place of Origin.	Time of Origin.	Earliest Bloom.	First Ripe Fruit.	Lat Picking.	Vigor Scale 1 to 10.	Hardness, 1 to 10.	Productiveness, in ounces.	Fungi.
56	Martha	B	Minn.	1886	May 17	June 18	June 30	9	10	63	a
57	May King	B	N. J.	"	" 24	" 16	" 30	8	9	39	a
58	Miami	P B	Ohio.	1878	" 24	" 18	July 2	9	10	78	d
59	Miner	B	N. J.	"	" 21	" 20	June 30	8	10	31	d
60	Monmouth	B	N. J.	1885	" 23	" 25	" 27	7	8	9	a
61	Moore	B	Mich.	1884	" 24	" 23	July 2	10	10	44	c
62	Mrs. Cleveland	P	Ohio.	1887	" 26	" 20	" 3	10	10	49	a
63	Mount Vernon	B	"	"	" 25	" 23	" 2	10	10	24	d
64	New Dominion	B	Ont.	1875	" 22	" 23	" 2	7	10	51	d
65	Nicanor	B	N. Y.	1850	" 16	" 16	June 25	4	10	36	e
66	Norman	B	"	"	" 20	" 18	" 27	9	10	20	e
67	Ohio	P	Ohio.	1888	" 26	" 25	July 3	9	10	32	e
68	Ohio Centennial	P	Ohio.	1888	" 26	" 25	" 2	9	10	36	a
69	Ontario	B	N. Y.	1885	" 24	" 20	June 30	9	10	20	a
70	Parker Earle	B	Texas.	1886	" 18	" 23	July 3	10	10	104	b
71	Parry	B	N. J.	1880	" 23	" 18	June 30	7	8	36	b
72	Pearl	B	N. J.	1884	" 24	" 18	" 30	10	10	96	b
73	Phelps (Old Ironclad)	B	"	"	" 16	" 20	" 27	8	10	15	b
74	Pineapple	B	Md.?	"	" 23	" 23	July 2	10	10	23	b
75	Piper	B	Ill.	1886	" 23	" 20	June 27	9	10	32	b
76	President	B	"	"	" 23	" 20	" 30	5	5	13	d
77	Prince of Berries	B	N. J.	1880	" 21	" 23	" 3	5	3	0	b
78	Seneca Queen	B	N. J.	"	" 21	"	"	5	7	0	c
79	Sharpless	B	Pa.	1874	" 22	June 23	June 27	10	10	20	b
80	Sucker State	B	Ill.	"	"	"	"	8	1	0	c
81	Summit	P	Ohio.	1880	May 29	June 27	July 2	6	5	15	d
82	Townsend No. 3	P	Ohio.	1888	" 21	" 23	" 2	10	10	40	c
83	Townsend No. 19	P	Ohio.	1888	" 26	" 20	" 3	10	10	56	a
84	Triomphe de Gand	B	Belg.	"	" 23	" 25	" 2	8	9	24	d
85	Unnamed (Little)	B	Ont.	1884	" 20	" 23	June 27	7	10	34	c
86	Vick	B	Mo.	1882	" 26	" 23	July 7	"	10	52	a
87	Warfield No. 2	P	Ill.	1883	" 23	" 20	" 5	8	10	55	b
88	Wilson	B	N. Y.	1860	" 18	" 18	" 2	7	10	67	b
89	Windsor	P	Mich.	1875	" 26	" 20	" 2	6	7	61	d
90	Wonderful	B	"	"	" 25	" 23	" 5	10	10	56	d
91	Woodruff No. 1	B	Mich.	1872	" 22	" 20	" 2	5	8	41	b

We add brief notes of such varieties in the foregoing list as have produced forty or more ounces of fruit upon the plat heretofore designated. The picking was done on Monday, Wednesday and Friday of each week.

Arnold's Pride, B. (*bisexual*) yet maintains its position as a desirable variety for the family garden, although too dull in color for the market.

Belmont, B. On strong soils, with good cultivation, its superior quality and good size should commend it for the family plat. Although a popular market berry, with Boston growers, it seems not likely to reach such position elsewhere.

Bomba, B. has done fairly well, here, this season; but it must continue to improve to insure general popularity. Its fault is the deficient size of the later fruits. Rich soil and high cultivation would doubtless improve it in this particular.

Bright Ida, B. like the three other Arnold seedlings, only brighter

STRAWBERRIES.—CONTINUED.

Fungi (*Spizierella fragariae* Sacc.)

a. clear.

c. much spotted.

e. general discoloration from

Sex.

b. slightly spotted

d. very badly spotted.

whatever cause.

B. bisexual.

P. pistillate.

Number.	Fruit.					Remarks.
	Size, Scale 1 to 10.	Quality, 1 to 10.	Firmness, 1 to 10.	Form.	Color.	
56	6	7	7	r d c	d r	Plant very vigorous. Promising for market.
57	4	7	5	r b c	l c	Scarcely profitable. Valued as a fertilizer for pistillates.
58	8	8	8	r d c	b c	A moderate producer of plants.
59	7	6	5	c	d c	Often cockscombed on heavy soils.
60	8	7	7	c	d r	Have rarely succeeded with it here.
61	10	6	7	o b c	l r	Much like Jessie in both plant and fruit.
62	8	7	8	r c	l c	A very healthy, vigorous plant.
63	7	8	7	r c	b s	Quite late. Valuable.
64	5	6	7	d c	b r	Has never been largely planted.
65	4	9	4	r o c	r	One of Ellwanger & Barry's earliest seedlings.
66	5	—	—	—	s	Has shown very little merit.
67	6	4	5	r c	b c	Late. Valuable for this, if at all.
68	—	—	—	—	—	Needs a further and more satisfactory trial.
69	9	8	6	b c	d s	Very vigorous. Much like Sharpless.
70	8	9	9	l b c	b c	Plant vigorous, and very hardy.
71	9	9	8	r c	l c	Plant somewhat lacking in vigor.
72	8	8	10	l c	c	So far, one of the most valuable here.
73	5	7	6	r c	s	Prized by some as a fertilizer for pistillates.
74	8	8	—	r c	r	Suspected to be an old variety renamed.
75	6	5	6	r c	b c	Lacks productiveness as a market variety.
76	4	7	6	r c	b c	Not productive enough.
77	7	10	9	r	l r	Persistently unproductive. Fine flavor.
78	7	8	6	r d	b r	Has shown a lack of hardness.
79	9	8	6	b c	b c	More productive if grown in hills.
80	6	6	6	r c	s	Lacks hardness.
81	9	7	5	r c	d s	Plant lacks vigor. Amateur only.
82	—	—	—	—	—	Needs farther trial. Promising.
83	—	—	—	—	—	Needs farther trial. Promising.
84	7	9	9	r c	b r	Requires strong, rich land and hill culture.
85	7	7	7	l c	c	Received without name, from John Little, of Ontario.
86	5	9	10	r	d c	Lacks size for the market.
87	6	7	5	r c	b c	Highly esteemed as a market variety.
88	6	8	10	c	d s	Later pickings run small. Old and valuable.
89	6	6	8-9	r c	d c	Apparently identical with Champion.
90	6	6	8-9	r c	d c	Like the foregoing; but bisexual as grown here.
91	8	6	8	r d c	d c	Slightly lacking in productiveness, and vigor.

color is needed to insure to this a prominent position as a market variety; since, in most other respects, both plant and fruit are satisfactory.

Bubach No. 5, P. (*pistillate*) Although requiring a fertilizer, and lacking the firmness requisite for distant marketing, this variety possesses, with uniformly large size, such an assemblage of valuable qualities, of both plant and fruit, that it has already assumed a high, if not even a leading, position among market varieties.

Burt, B., sent out two or three years ago, from Northern New York, was, for a time, quite generally suspected to be an old variety re-named. The plants received here, however, are clearly distinct. Two years' fruiting have shown valuable qualities of both plant and fruit; affording ground for the conviction that, though of only medium size, it may be expected to take rank among the more profitable market varieties.

Captain Jack, B., has long been known to possess many valuable

qualities of both plant and fruit; and to lack little, except size, to render it a valuable variety for the market.

Champion (Windsor), P., was a leading market variety ten to fifteen years ago. An alleged cross of Chas. Downing upon this, about that time, received the name, Windsor Chief. The suffix, however, soon sloughed off, leaving only the Windsor. The apparently complete identity of the two at once begot the conviction that there had probably been a mistake; and that the alleged parent and child were, in fact, one and the same. More recently the earlier name seems to have become nearly obsolete—both being known as Windsor.

Cloud, P. This comes to us as a Louisiana seedling. Originating in an extreme southern climate, the fact that it proves specially hardy here, may well be a matter of surprise; and the more so, for the reason that it promises to be even hardier and more generally satisfactory, at the north, than the average of the northern varieties. The plant is vigorous and productive; and the fruit, though only of medium size, bears transportation unusually well, promising to prove generally acceptable as a market variety.

Crawford, B. Only half a dozen plants of this were obtained last season; and from these, and their increase, the results given in the foregoing tabulation have been obtained. Under the circumstances, these results are deemed very favorable; and it is anticipated that, with a fuller and fairer trial, the variety will justify the high encomiums of its usually careful originator, who has bestowed upon it his own name.

Crescent, P., is too well and favorably known to require extended notice. It only need be stated that, for some reason, it is less productive this season than usual; several other varieties having exceeded it in this particular, under apparently equivalent conditions.

Cumberland, B., with many valuable qualities, is yet too large, too soft, and too deficient in color, as well as in productiveness, to prove quite satisfactory as a market variety, while it is scarcely good enough for the family garden.

Dew, B., is enormously large, in both plant and fruit. It originated recently at Lansing, Michigan, with the gentleman whose name it bears, where, on heavy soil, it is said to be very productive. On light sandy loam, at this station, the plant is exceedingly vigorous, and the fruit very large, firm, of rich, dark color, and the larger fruits usually cockscombed, though seldom objectionably so. Here, so far, it does not prove very productive.

Duncan, B., is a very old variety, of much merit, though elbowed aside by more recent novelties. It has, this season, proved specially productive.

Hampden, B., a recent Massachusetts variety, is large, firm, and of rather high quality; but, so far, comparatively unproductive. It requires further trial.

Haverland, P., fully maintained its reputation of last year. It sets a heavy crop of fruit, and must have rich soil and good cultivation, to be able to carry it to full maturity.

Itasca, P., seemed to occupy the margin between success and failure. With good soil and high cultivation, it will, doubtless, be found profitable; while, with ordinary treatment, much of its early promise will be likely to fail of realization.

Lady Rusk, P., was nearly ruined last season by cutworms, which circumstance has, very probably, affected its performances the present season. It therefore requires further trial.

Logan, B., originated a few years since in Indiana. The plant is vig-

orous and hardy. So far, it has not shown sufficient productiveness to secure popular recognition.

Louise, B., is a recent novelty, hailing from New York. Its fine size and generally attractive appearance, commend it for very general trial, although it is scarcely firm enough to bear transportation over long distances. In season it is later than medium.

Maggie, B., would be very satisfactory, even as a market berry, but for its lack of color. To those who prefer mild flavor, it would probably prove acceptable for the family plat.

Manchester, P., is only too productive. The plant usually so exhausts its vigor in maturing its crop, that it is found more profitable to turn it under after one full crop, thus replanting annually.

Martha, B., is a recent Minnesota seedling, originating at Minneapolis. The plant has the dark, rich, healthy foliage of Captain Jack, Vick, and Burt; and, as the tabulation shows, it promises value for the market, for which purpose its firmness and its high, rich color especially fit it.

Miami, P. B., should be treated as a pistillate. It is yet probably new to the majority of planters. It stands high as a producer, as indicated by the test of the present season, and seems worthy of trial by planters generally.

Moore, B., is said to have originated at Plymouth, Michigan, several years since. In plant as well as in fruit, it is much like Jessie, which it slightly excels in productiveness, while fully equaling it in other desirable qualities, whether of plant or fruit, as shown by the trials of the last two years.

Mrs. Cleveland, P., first offered for sale last spring, comes from the originator of the Eureka, the Ohio Centennial, and several others, not yet named or disseminated. Although this season's test has scarcely been an adequate one, the results are so far favorable that we feel warranted in commending it for general trial.

New Dominion, B. This has now been for more than a decade in the hands of planters, becoming at no time more than locally popular, while it has now, very generally, given place to more recent candidates for popular favor.

Parker Earle, B., was received from northern Texas, too late in the autumn of 1888, to gain more than a slight hold upon the soil in advance of winter. With only a slight mulch, the plants came out the next spring uninjured, and formed a well filled matted row during the growing season. This was left wholly unprotected through the past winter and has now, as shown by the foregoing table, very considerably excelled any and all others, in the amount of fruit produced. Unless it shall, in the future, betray weaknesses not yet discovered, its bisexual character, together with its fine size, bright appearance, and fair quality, must infallibly command the attention of planters, whether for the family or market.

Pearl, B., is another, at least semi-southern, variety, hailing from southern New Jersey, which succeeds unusually well in our more northern locality, standing only second to the Parker Earle in productiveness, and even exceeding it in the firmness of texture so necessary in a first-class market berry. It seems eminently worthy of extensive trial.

Townsend's No. 3, and No. 19, both pistillate, are new varieties, from the Ohio originator of that name, which are not yet either named or offered for sale. They have had but a partial trial here, so far, and are to be given a more satisfactory test in the experimental plat for next season.

Vick, B., although introduced from Rochester, N. Y., purports to be a native of Missouri. With the hardiness and vigor apparently character-

istic of varieties of Southern origin, it only lacks size to render it desirable as a market variety.

Warfield No. 2, P. Though of only medium size and firmness, this variety possesses so many valuable characteristics of both plant and fruit, that it has rapidly advanced to near the front rank in the market list. That it can permanently hold such position, except in rich soils, and with better than average cultivation, may be matter for doubt.

Wilson, B., so long the nearly universal favorite, as a market variety, as appears from the tabulation, stands as low as sixth in productiveness, in the present trial.

Windsor, P. Although we early received plants of this from the alleged originator, and have kept this and its alleged parent—the Champion—under cultivation, separately, from the first, we have failed to discover the slightest difference between them, in either plant or fruit.

Wonderful, B. This, by many, is claimed to be the Champion, which it closely resembles in both plant and fruit. The plants received here from a leading New Jersey establishment, which puts forth the above claim, are, however, unmistakably bisexual.

□ Woodruff No. 1, B. With greater vigor of plant, this would, very probably, have taken prominent rank as a producer. As it is, however, it barely comes within our assumed limit. It has never been more than locally popular, in the vicinity of its origin. Ann Arbor, Michigan.

For one cause or another, the following varieties have, at least during the past season, failed to come up to the requirement of the foregoing selection, while their failure so to do is yet not such as would seem to warrant their actual rejection. Some of them possess merit for special purposes, while others seem to have been exceptionally unproductive; and yet, with others, the trial has been so far imperfect or unsatisfactory that further trial seems needful, to determine their real merits. For such reason, the following are included in the plantation for next year's trial:

Alpha,	Garrettsen,	Monmouth,	Seneca Queen,
Bidwell,	Jessie,	Mount Vernon,	Sharpless,
Eureka,	Little's No. 10,	Nicanor,	Sucker State,
Florence,	Loudon's No. 15,	Ohio Centennial,	Summit,
Galceron,	May King,	Ontario,	Triomphe de gand,
Gandy,	Miner,	Parry,	Unnamed (Little).

The following, which appear in my report of last year, have been omitted in the present trial, as unworthy or not requiring further trial here.

Acme,	Early Canada,	Hathaway No. 5,	Sunapee,
Boone,	Emerald,	Hathaway No. 9,	Surprise,
Cohanzyck,	Garibaldi,	Richmond,	Warren,
Dewey,	Hathaway No. 3, Shirts.		

Clara, of my previous report, has been re-named by the introducer, and appears in the present lists as Florence.

Jersey Queen of my last year's report, which does not appear in this, has been replanted for further trial next year.

A new plat was planted in May last, to be used for experimentation next year, including one hundred and forty-eight varieties. Twenty-four plants of each variety have been planted, when that number was obtainable. In cases of deficiency, the number is being made up, as promptly as practicable, by layering runners from those planted.

One half of those planted, of each variety, are being grown in hills, while the remaining half are allowed to form matted rows of a definite

length and width; the purpose being to determine the adaptation and the profitableness of each, under the two methods.

RASPBERRIES. (*Rubus*.)

VARIETIES OF *IDÆUS* AND *STRIGOSUS*, WITH SUPPOSED HYBRIDS OF THESE, INCREASING BY SUCKERS FROM THE ROOTS.

Owing probably to the unusually mild winter these species of raspberry have suffered little, if any, apparent injury from cold, except in the case of the Brinckle, an American seedling of pure *Idæus* parentage.

A comparison of the accompanying tabulation with that given last year shows that, notwithstanding the occurrence of unfavorable weather during and previous to the blooming season, the variation in time has been but slight, though the bloom of the present season has averaged somewhat earlier than that of last year. On the other hand, some of the varieties this year have proved more tardy in ripening; owing, apparently, to the continuance of cold, wet weather during the interval.

As shown under the head of Fungi, in the accompanying table, the older canes of a few varieties have suffered to a greater or less extent from Anthracnose, or Raspberry Cane Rust (*Glucosporium venetum*, Speg.), though less seriously than is the case with the cap varieties, *occidentalis*.

No insects have proved troublesome to this fruit the present season. The raspberry cane borer, *oberea bi-maculata*, which was slightly troublesome last year, has failed to appear the present season. The occasional work (apparently of an insect, which has so far eluded discovery), partially skeletonizing the younger foliage, has been observed, but not to a serious extent.

The following are among the most desirable or promising of those included in the foregoing table, arranged, as nearly as practicable, in the order of their maturity, as it has occurred the present year.

Thompson is a variety recently brought out at Lakewood, near Cleveland. It proves to be very early, and claims to be very productive also; but further trial is needful to establish the correctness of the latter claim. So far it appears healthy, vigorous, and the fruit bright colored, attractive, and of good quality.

Hansell follows the foregoing very closely. The plant is only moderately vigorous, and the fruit neither large nor of high quality. Still it is worthy of being planted to a limited extent, on account of its earliness.

Brinckle, a pure *Idæus* seedling, originated in a Philadelphia city garden, many years since, by the once noted amateurs, whose name it perpetuates. It is a prince among raspberries, so far as both variety and quality are concerned; but, sad to say, it must have protection, even in ordinary winters.

Marlboro takes its name from the town, in eastern New York, in which it originated; and is put forward as a market variety. The plant is hardy and moderately vigorous; and the fine size and attractiveness, as well as the tolerable quality of the fruit, suffice to render it popular.

Turner has been too long and too generally and favorably known to require description. On strong, rich soil, and especially where superior hardiness is requisite, it may fairly be accorded a leading position among varieties of its class.

Reder is a Berrien county seedling. Although the plant is only moderately vigorous, and increases but slowly, the fruit has but few superiors, if even equals, among red varieties so far as size, color, and quality are concerned.

RASPBERRIES

VARIETIES OF *IDÆUS* AND *STRIGOSUS* AND SUPPOSED

				ABBREVIATIONS.								
Species.								Form.				
I. Ideus.								c. conical.				
S. Strigosus.								i. irregular.				
H. Apparent hybrid.								r. roundish.				
				Plant.								
Number.	Name.	When Planted.	Species.	Place of Origin.	First Bloom.	First Picking.	Last Picking.	Vigor, 1 to 10.	Hardiness, 1 to 10.	Productive-ness, 1 to 10.	Fungl.	
1	Brandywine	1888	S	Penn.?	June 7	July 9	Aug. 11	6	9	6	---	
2	Brinckle	1888	H	Penn.	" 8	" 5	" 2	4	2	2	---	
3	Caroline	1888	H	N. Y.	" 7	" 9	July 30	5	10	10	---	
4	Crimson Beauty	1888	S	Kan.?	" 6	" 5	" 30	6	7	5	A-	
5	Cuthbert	1888	S	N. Y.	" 14	" 11	Aug. 13	10	9	10	---	
6	Eastern King	1888	S	N. E.	" 10	" 9	" 1	6	6	6-7	---	
7	Golden Queen	1888	S	N. J.	" 15	" 7	" 4	10	9	8	---	
8	Hansell	1888	S	N. J.	" 4	" 7	" 11	7	8	8	A-	
9	Herstine	1888	I S	Penn.	" 11	" 9	" 4	4	4	6	A+	
10	Marlboro	1888	S	N. Y.	" 5	" 5	" 1	8	9	10	---	
11	Meredith	1888	S	N. E.	" 15	" 9	" 1	6	7	7-8	---	
12	Michigan Early	1890	S	Mich.?	" 12	" 7	" 7	7	8	7	---	
13	Miller's Woodland	1890	S	"	"	"	"	7	7	6	---	
14	Philadelphia	1888	S	Penn.	June 14	July 9	Aug. 4	7	10	10	---	
15	Rancocas	1888	S	N. Y.?	" 4	" 7	July 28	5	6	6	---	
16	Reder	1888	S	Mich.	" 7	" 7	Aug. 1	6	8	9	A-	
17	Reliance	1888	S	N. J.	" 12	" 9	" 4	6	10	10	A-	
18	Scarlet Gem	1888	S	"	" 5	" 7	" 1	7	6	5	A-	
19	Superb	1888	S	N. J.	" 9	" 7	" 4	4	8	9-10	---	
20	Thompson's Early	1889	S	Oh'io.	" 7	" 5	July 23	7	7	5	---	
21	Turner	1888	S	Ill.	" 4	" 7	Aug. 6	9	10	6	---	

Superb originated in New Jersey, contemporaneously with Hansell, and ripens nearly with that variety. The berry is large, often seven-eighths of an inch in diameter. It is high flavored, like most of the *strigosus* species, to which it belongs. The berries are so loosely formed that they crumble badly in picking and handling. The color also is too dark to suit the popular fancy.

Golden Queen possesses all the valuable qualities of the Cuthbert, whether of plant or fruit, which is bright yellow when ripe. It is alleged to have been discovered in a plat of Cuthbert plants, and is supposed, by the originator, to be a sport from that variety.

Cuthbert is a native of Riverdale, New York. Although not absolutely hardy it is among the hardiest of the species; which fact, together with its healthy, persistent foliage, its vigor and productiveness, and the superior handling quality and pleasant flavor of its fruit, have won for it a high position, both as a family and a market fruit.

Herstine bears the name of its originator or discoverer, a Mr. Herstine of Pennsylvania. Originating, probably by hybridization between *Idæus* and *strigosus*, it is supposed to have inherited a deficient hardiness and, at the same time, its bright color, fine size and superior quality, from the former. With slight protection in winter, it will be found eminently desirable as a family berry.

Brandywine is an old variety of unknown origin, which proves valuable

RED AND ORANGE.

HYBRIDS FROM THESE WHICH PROPAGATE BY SUCKERS.

Color.			ABBREVIATIONS.		Frugi.	
b. bright.	g. glossy.	pu. purplish.	A—	Anthracnose (<i>Gloeosporium venetum</i> , Spy.) light.		
d. dark.	l. light.	r. red.	A+	Anthracnose, severe.		
p. pubescent.	o. orange.					
Fruit.						Remarks.
Number.	Size, 1 to 10.	Quality, 1 to 10.	Firmness, 1 to 10.	Form.	Color.	
1	6	6	9	r	d r	Suckers freely. Valued for market.
2	7	10	9	r c	o	Very tender. Requires winter protection.
3	7	8	4	r	l o	Increases by both suckers and tips.
4	9	6	6	r	d r	Berries are frequently imperfect.
5	10	8	10	r c	r	Of fair quality. Valuable for market.
6	7	4	4	r	p r	Not relatively valuable.
7	10	8	10	r c	l o	A supposed sport from Cuthbert; of similar quality.
8	6	5	7	r	d r	Valued mainly for its earliness. Market.
9	9	10	6	r	b r	One of the best in size and quality. Lacks hardness.
10	9	6	7	r	p r	Large and early. Profitable.
11	6	5	6	r	l o r	Beautiful; but lacks quality and productiveness.
12	6	4	7	r c	d r	Poor in flavor. Actual origin not known.
13	6	4	7	r	d r	An old variety. Now nearly superseded.
14	4	4	5	r	d pu r	Very hardy and productive; but nearly superseded.
15	3	5	6	r	r	Apparently of little value.
16	8	9	8	r	r	A moderate grower. Quality superior.
17	8	5	9	r	d r	A seedling of Philadelphia. Superior to its parent.
18	6	4	5	r	b r	Beautiful; but lacks productiveness.
19	10	7	5	r i	d g pu	Large; high flavored. Fruit crumbles badly.
20	6	6	4	r	l r	Lacks productiveness; but needs further trial.
21	6	9	4	r c	r	Canes thornless; lacks productiveness. Very hardy.

for market purposes. Its texture is such that, even when fully ripe, it can remain ungathered for some time, without essential deterioration.

The following varieties will afford a satisfactory succession for family use, while the surplus, if any, will prove available for market.

First, Thompson; second, Turner; third, Herstine; fourth, Golden Queen; fifth, Cuthbert. With high culture and careful winter protection, improved quality may be secured by adding the Brinckle.

Several of these so-called "tip rooting" varieties, if we may reason from the color and other peculiarities of their fruit, may be supposed to have originated, more or less directly, from the old Purple Cane, the origin of which is not now known, but the characteristics of which indicate a possibly hybrid origin, in the remote past.

Brief notes are added of the more valuable or promising of the tabulated varieties, which are mentioned, as nearly as practicable, in the order in which they ripen.

Souhegan and Tyler, originated separately, are yet practically identical, and in no important particular, differing from Doolittle, which is the oldest of the named blackcaps, and ripens at the same season.

Cromwell (which appeared in last year's report as Butler—the name of its originator), is a Connecticut seedling, ripening with the early varieties, and nearly or quite identical in both plant and fruit. Further trial is needful to fully determine its comparative value.

Hopkins has valuable qualities as a market variety of medium season.

RASPBERRIES,

VARIETIES OF OCCIDENTALIS AND SUPPOSED HYBRIDS—

Number.	Species.	Form.	Color.	ABBREVIATIONS.									
				Plant.									
Number.	Name.	When Planted.	Species.	Place of Origin.	First Bloom.	First Picking.	Last Picking.	Vigor, 1 to 10.	Hardiness, 1 to 10.	Productiveness, 1 to 10.	Fung.		
1	Ada.....	1890	O	Ohio	June 16			5	10		A—		
2	Beebe.....	1888	O	N. Y.	" 8	July 11	Aug. 6	9	10	10	A—		
3	Carman.....	1888	O	Conn.	" 7	" 9	July 25	4	10	6-7	A+		
4	Centennial.....	1888	O	"	" 9	" 6	" 28	6	10	7	A—		
5	Cromwell (Butler).....	1888	O	Conn.	" 6	" 5	" 28	6	10	9	A+		
6	Doolittle.....	1888	O	N. Y.	" 6	" 5	Aug. 1	7	10	10	A+		
7	Domore.....	1890	O	Ohio	" 6			9	10				
8	Earhart.....	1888	O	Ill.	" 6	July 9	Oct. 9	9	10	6-8	A—		
9	Gregg.....	1888	O	Ind.	" 12	" 11	Aug. 11	9	8	10	A—		
10	Hilborn.....	1888	O	Ont.	" 12	" 9	" 8	6	10	9	A—		
11	Hopkins.....	1888	O	Mo.	" 10	" 5	" 4	7	10	8	A—		
12	Indiana.....	1888	O	Ind.	" 8	" 11	" 1	5	10	10	A—		
13	Johnston's Sweet.....	1888	O	N. Y.	" 10	" 11	" 6	6	10	9-10	A+		
14	Mammoth Cluster.....	1888	O	N. Y.	" 11	" 14	" 4	7	10	8	A—		
15	Nemaha.....	1888	O	Neb.	" 11	" 14	" 4	9	10	9	A—		
16	New Rochelle.....	1888	H	N. Y.	" 9	" 9	July 30	5	8	8	A+		
17	Ohio.....	1888	O	N. Y.	" 10	" 11	Aug. 4	7	10	10	A—		
18	Palmer.....	1890	O	Ohio	" 9			7	10				
19	Shaffer.....	1888	H	N. Y.	" 15	July 11	" 6	10	10	10	A+		
20	Souhegan.....	1888	O	N. E.	" 5	" 5	July 28	7	10	9	A—		
21	Tyler.....	1888	O	"	" 5	" 5	" 30	7	10	9	A—		

Earhart, disseminated by Connecticut parties, several seasons since, is probably the most valuable of the varieties classed as everbearing, producing a light crop, upon the last year's canes, at the usual season; and a second fair crop, in September and October, upon a portion of the canes of the same season's growth. It is desirable mainly on account of such second crop, which continues to ripen until ruined by frost.

Beebe is really golden and beautiful, when taken at just the right stage; but when past such stage, the color rapidly changes to a forbidding, dirty brown, with loss of flavor, unfitting it to appear upon the table.

Centennial has useful qualities as a medium season, market variety, but it is, in no special sense, superior to other varieties of similar season.

Indiana, a comparatively recent origination, from the state of that name, is, like the foregoing, an average medium season variety.

Johnston's Sweet, a seedling from western New York, ripens slightly after the medium season. It is very productive, of medium-size, mild flavored fruit. It is quite seedy and, doubtless for that reason, yields better than average returns when dried.

Ohio is yet another variety specially valued for drying, doubtless for a similar reason.

Shaffer is an unusually vigorous grower for even one of this class. Doubtless on account of the color of the fruit, many persons have assumed

Rubus.

ROOTING FROM THE TIPS OF THE CANES.

ABBREVIATIONS.

Color.
pu. pubescent.
s. slight.
v. very.

Fungi.
A-. Anthracnose—slight.
A+. Anthracnose—severe.

Number.	Fruit.					Remarks.
	Size, 1 to 10.	Quality, 1 to 10.	Firmness, 1 to 10.	Form.	Color.	
1				r	b	Not yet fully tested here.
2	5	5	8	r	c	When overripe the color is far from attractive.
3	5	6-7	8	r	b	Does not prove relatively valuable here.
4	6	6	9	r	g b	Others excel this as market varieties.
5	6	7	8	r	b	Has not, so far, proved large or productive enough
6	7	7	6	r	g b	The oldest, and even yet one of the best early varieties.
7				r	b	A new variety, not yet properly tested here.
8	4-8	7	8	r	b s pu	Very vigorous; produces a second crop in September.
9	10	4	10	r o	b v pu	Very productive; occasionally injured in winter.
10	6	6	8		b	Plants prove to be spurious.
11	7	6	7	r	b pu	Profitable, and generally satisfactory.
12	6-7	5	9	r	b	A seedling originated in the State of Indiana.
13	5	7	9	r	g b	Mild in flavor, valued for drying. Quite seedy.
14	7	8	7	r	b v pu	Old; but still valued as a market variety.
15	10	7	9	r	b pu	Much like Gregg—claimed to be hardier.
16	7	7	5	r c	d p pu	Purple; with the habit and hardness of a blackcap.
17	6	6	8	r	b	Productive but seedy; valued for drying.
18				r	b	Not yet fully tested here.
19	10	9	7	r i	p pu	Highly valued especially for canning.
20	5	8	8	r	g b	Very early—valued for that reason.
21	5	8	8	r	g b	Practically identical with Souhegan.

it to be of hybrid origin. It originated accidentally, near Rochester, New York. The fruit is of the largest size, very juicy and high flavored, dingy purple, and very pubescent. It occasionally produces a partial crop in autumn, upon canes of the same season's growth. It is specially valued for canning.

Mammoth Cluster is a late ripening variety, formerly popular for the market, and even yet occasionally planted for that purpose.

Gregg, although slightly less hardy than most other blackcaps, is so vigorous and productive, and the fruit so large and firm in texture, that it stands at the head of the market list of its class.

Nemaha originated some time since in Nebraska. In both plant and fruit it is much like Gregg, but is alleged to be more hardy—a claim the validity of which can scarcely yet be considered as determined here.

Among blackcaps of established reputation, a valuable selection for a family garden would be Souhegan, Tyler or Doolittle, for early, followed by Hilborn (the genuine) and Nemaha with Shaffer for canning. For a market list Gregg may be substituted for Hilborn.

A large number of new varieties of this species have been planted for trial, the characteristics of which will require further time to develop. Except in a very few cases these have been omitted from the tabulations given, to await such further experience.

BLACKBERRIES, *Rubus villosus*.

Neither insects nor fungi have proved injurious to the varieties of this fruit upon the premises during the present season. The warmth of the past winter and the cold of the spring, which proved so injurious in case of the larger fruits, produced little, if any, injurious effect upon the blackberry, since even the more tender varieties have wholly escaped injury.

A few varieties, notably Ancient Briton and Western Triumph, which have a tendency to overproductiveness, were heavily laden with fruit during the heat and drouth of July and August last, a portion of which dried up on the branches while yet immature.

The varieties of this fruit first introduced, such as Dorchester, Kittatiny and, more recently, Snyder, are of the wild native type, with stout, tall, upright canes; while among more recent introductions will be found several varieties of a spreading or semi-trailing habit, with a partial tendency to take root from the tips of the branches, when circumstances favor. Among such are Wilson, Wilson Jr., and, in a slight degree, Taylor, and possibly some others, thus indicating the possibility of a more or less remote hybridization between *villosus* and *Canadensis*.

Originators or discoverers and introducers of novelties are accustomed to give little, if any, attention to the history of such introductions, for which reason items of this character, as given in the accompanying tables, are unavoidably more or less unreliable.

BLACKBERRY (*Rubus villosus*)

ABBREVIATIONS.

Habit of Growth.

s, spreading,
t, tall.

tr, trailing,
u, upright.

Number.	Name.	Plant.								
		Place of Origin.	Introduced.	Habit of growth.	Earliest bloom.	First pick- ing.	Last pick- ing.	Vigor, 1 to 10.	Hardiness, 1 to 10.	Productive- ness, 1 to 10.
1	Agawam.....	Mo. ?	1874	u s	June 6	July 23	Sept. 3	7	8-9	9-10
2	Ancient Briton.....		1875	u	" 6	Aug. 1	" 8	8	8-9	10
3	Bonanza.....		1880	u s	" 12	July 23	" 1	6	7	9
4	Dorchester.....	N. E.	old	u s	" 5	" 28	Aug. 20	4	3	5-6
5	Early Cluster.....	N. J.	1878	u s	" 13	" 30	" 29	4	6	8
6	Early Harvest.....	Ill.	1882	u s				4	9	9-10
7	Erie.....	Penn.	1886	s tr	June 12	July 23	Sept. 5	9	9-10	9-10
8	Kittatiny.....	N. J.	1850	u s	" 12	" 28	" 8	9	6	9
9	Knox.....			u	" 12	" 28	" 10	5	6	7-8
10	Lawton.....	N. Y.	1845	s	" 12	" 28	" 10	7	4	8-9
11	Minnewaski.....	N. Y.	1886	t s	" 12	" 30	" 5	7	6	8
12	Nevada.....		1887	u	" 13	" 30	Aug. 29	5	5	6-7
13	Snyder.....		1876	u	" 5	" 25	Sept. 3	8	10	10
14	Stone's Hardy.....	Wis.	1875	s				8	10	8
15	Taylor.....		1873	u s	June 6	July 25	Sept. 8	8	10	9
16	Thompson's Early.....	Ohio.	1888	s	" 9			6		
17	Wachusett.....	Mass.	1880	s				4	10	
18	Wallace.....	Wis. ?	1874	u s	June 7	July 28	Aug. 25	7	8	6-7
19	Western Triumph.....		1876	t u	" 5	" 30	Sept. 5	10	9	10
20	Wilson.....	N. J.	1854	s tr	" 7	" 23	" 1	8	6	10
21	Wilson, Jr.....	N. J.	1878	s tr	" 7	" 23	" 1	9	6	9-10
	Dewberry, <i>Rubus Canaden- sis</i> .									
22	Lucretia.....	Vir.	1880	tr	" 3	" 19	" 4	5	3	9-10
23	Windom.....	Minn.	1886	tr	" 15			4		

Short notices are added, of the more desirable varieties tested here which have already become popular (or are deemed worthy to do so), arranged, as nearly as practicable, in their order of ripening.

Lucretia Dewberry, is of good quality and large size, as well as very productive. Owing to its trailing habit, it usually escapes injury in winter. Of doubtful value as a market fruit, it comes in with the early blackcaps, and is, for that reason, appropriate for the family garden. A mulch is needful, during the ripening season, to prevent the soiling of the fruit.

Early Harvest, for a time, lost reputation, on account of the dissemination of the Brenton (a very tender variety), under this name. The genuine is hardy, very early and productive; and, though small, is of beautiful appearance and good quality.

Agawam is hardy and vigorous and the fruit large and excellent, for so early a variety. It seems to be worthy of extended trial.

Wilson and Wilson Jr. may, for all practical purposes be considered identical. The plants are vigorous and productive. Their spreading, semi-trailing habit, with a slight tendency to root from the tips, may be supposed to indicate an infusion of *Canadensis* blood. The fruit is very large, but not of high quality. The plants, at the north, require protection in winter.

AND DEWBERRY (*Rubus Canadensis*).

ABBREVIATIONS.

Form of Fruit.		Color.
i, irregular.	ov, oval or ovate.	b, black.
o, oblong.	r, roundish.	

Number.	Fruit.					Remarks.
	Size, 1 to 10.	Quality, 1 to 10.	Firmness, 1 to 10.	Form.	Color.	
1	9	8	4	r o	b	Large, good, and nearly hardy.
2	6	5	7	ov	b	Nearly hardy, but lacks size.
3	9	7	-----	o	b	Hardiness and productiveness yet uncertain.
4	4	10	10	o	b	An old variety, nearly superseded.
5	6	8	5	r o	b	Not productive or otherwise valuable.
6	4-5	9	10	r o	b	Genuine. Brunton has been sent out for this.
7	10	10	4	r o	b	Very vigorous; hardy; promising for market.
8	10	10	5	o	b	One of the oldest and best; lacks hardiness.
9	7	7	6	r ov	b	Well worthy of general trial for market.
10	9	9	5	o ov	b	Should not be picked till fully ripe.
11	10	9	6	r ov	b	Worthy of extended trial for market.
12	7	6	6	o	b	Requires further trial.
13	6	10	4	r o	b	Fine flavor; rather small; one of the hardiest.
14	6	8	5	r o	b	Hardy; productive; fruit lacks size.
15	7	10	4	r o	b	Canes greenish yellow; hardy; excellent.
16	-----	-----	-----	-----	b	Is claimed to be valuable on account of earliness.
17	-----	-----	-----	-----	b	Nearly or quite thornless.
18	9	9	4	r o	b	Large and good; valuable for home use.
19	6	10	5	ov	b	Very hardy; overbears; large size.
20	10	7	6	r o i	b	Very large; lacks flavor; canes winterkill.
21	10	7	6	r o i	b	A reproduction of its parent, the Wilson.
22	10	8	4	o	b	Ripens with the early blackcaps.
23	4 ?	-----	-----	-----	b	A new northwestern variety; said to be very hardy.

Snyder is strong, healthy, and very hardy, but the fruit, though of excellent quality and abundantly produced, is quite deficient in size. It has long been a popular favorite, on account of its hardiness.

Taylor is the equal of Snyder in hardiness, productiveness, and quality. It is slightly later in ripening, and of somewhat larger size. It is deserving of popularity, whether for home use or market.

Wallace is a moderately hardy, large, and fairly productive variety; which seems to deserve more attention than it has, so far, received.

Erie, with another year's experience, shows, very conclusively, that it is distinct from the Lawton. It promises well, for both family and market purposes. the chief question being as to its sufficient productiveness.

Kittatinny, though one of the very early introductions, may still be said to stand at or very near the head of the list, so far as quality, size, and productiveness are concerned. Lack of hardiness is one of its chief drawbacks.

Lawton is one of the earliest introductions, and is too well known to require description. In Michigan the plants need winter protection and the fruit is too acid, unless left upon the plant till fully ripe.

Western Triumph and Ancient Briton are varieties of western origin. Both are hardy and vigorous, and even excessively productive, but their fruit is too small to be popular in the market.

Minnewaski is hardy and vigorous. The fruit is also large and of fair quality. Its value must apparently depend largely upon its productiveness, as compared with several other varieties which compete closely with it in this, and perhaps other particulars.

Stone's Hardy is of Wisconsin origin, in which state it has the reputation of superior hardiness. It is also satisfactory in Michigan, except that the fruit is too small. It will no doubt be found valuable in localities in which great hardiness is required.

A good succession for a family plantation is, Lucretia (dewberry), Early Harvest, Kittatinny (with winter protection), Snyder, Taylor.

For market, Early Harvest, Wilson or Wilson Jr. (with winter protection), Snyder, Taylor.

CURRENTS, *Ribes rubrum*, *nigrum*, and *aureum*.

This class of plants appears to be specially liable to the depredations of insects.

The imported currant worm, *Nematus ventricosus*, has proved more than usually troublesome this season; and the injury has proved the more serious for the reason that fresh and pure hellebore proved not to be readily obtainable when needed.

The currant twig borer (whether the native or the imported we have not so far been able to determine), proves to be a very troublesome obstacle to currant culture here, at the lake shore, since the only effective remedy at present consists in cutting away and burning the infected branches, thus destroying much of the fruit-bearing wood for the following year. Heretofore the wood of the Victoria has been nearly exempt from the attacks of this insect; but from some unexplained cause, neither this nor the black varieties have escaped its ravages this year.

The premature loss of foliage, during July and August, due, probably, to attacks of fungus, is a malady common to all the red and white

varieties, excepting only Victoria and Long Bunched Holland, which appear to be at least partially exempt. The occurrence of hot, dry weather, during July and August, appears to be promotive of this malady.

The white currants are treated, by botanists, as mere varieties; and since, in each case, the name indicates this color, they, in common with the red varieties, are included in the species *rubrum* in the following table, without further designation:

CURRANTS, RED, WHITE AND BLACK.

Number.	Name.	Plant				Fruit.		Remarks.		
		When Planted.	Species.	First Blossom.	Crop Gathered.	Vigor, 1 to 10.	Productiveness, 1 to 10.		Size, 1 to 10.	Quality, 1 to 10.
1	Black Champion	1859	Nigrum.	May 10	July 21	10	6	8-10	8	Requires further trial.
2	Black Naples	1888	Nigrum.	" 12	21	10	6	8-10	8	Vigorous, very unsky.
3	Cherry	1888	Rubrum	" 14	14	9	7	10	7	Large, productive, acid.
4	Crandall	1889	Aureum	Aug. 22	10	10	10	8		An improved <i>aureum</i> .
5	Fay	1888	Rubrum	May 14	July 14	9	6	10	8	Cherry, with a longer bunch.
6	Lakewood	1890	Rubrum							New, wholly untested.
7	Lee	1888	Nigrum.	May 14	July 21	10	6	8-10	8	Much like Black Naples.
8	London Red	1890	Rubrum	" 14						Yet untested.
9	Long Bunched Holland	1889	Rubrum	" 14	July 14	10	3	5	5	Vigorous, so far unproductive.
10	Moore's Ruby	1890	Rubrum	" 12						Origin, Rochester, N. Y.
11	Moore's Select	1890	Rubrum			5				From Massachusetts.
12	Prince of Wales	1890	Nigrum.							New, untested.
13	Red Dutch	1888	Rubrum	May 12	July 14	10	7	8	9	Oldest, but still the best.
14	Saunders	1890	Nigrum.							Origin, Ontario.
15	Versaillaise	1888	Rubrum	May 14	July 14	9	7	10	7-8	Much like Cherry and Fay.
16	Victoria	1888	Rubrum	" 12	14	10	8	7	6	Valued for market.
17	White Dutch	1888	Rubrum.	" 12	14	6	6	8	10	Richest and sweetest of currants.
18	White Gondoin	1890	Rubrum.							Not new, but untested here.
19	White Grape	1888	Rubrum.	May 9	July 14	8	6	9	8	Best white for market.
20	Wilder	1890	Rubrum.	" 10						Not yet fruited here.

The variation among currants is comparatively slight, whether as to quality, size, or productiveness.

The following varieties will constitute a satisfactory selection for home or domestic uses:

White Dutch, although slightly deficient in vigor, is the mildest and richest flavored; and, at the same time, the most beautiful of currants. It is abundantly productive.

Red Dutch, although slightly smaller in berry than Cherry, Versaillaise, or Fay, is longer than these in bunch, at least equally productive, while it is decidedly superior in flavor. It is generally recognized as the best of the red currants.

Victoria is slightly later and more acid than Red Dutch, and rivals it in productiveness. In localities in which the twig borer is troublesome, this may very properly be substituted for Red Dutch, even for a home plantation.

Lee is a desirable black currant for the home plat, when fruit of this species is desired for culinary or other purposes.

The European (*grossularia*) varieties only prove reliable in specially favorable locations, or with special treatment. For general planting, whether family or market purposes, only those usually supposed to be of native parentage can be safely relied on.

Houghton is the oldest of these, and although the fruit lacks size, and the plant is of straggling habit, it is so thoroughly hardy, vigorous, and productive, and the quality so satisfactory, that it may well, as it does, hold a leading place, even in a list for home use.

Smith, though the least vigorous of the so-called natives, is yet a healthy though moderate grower, and withal very productive. Its fruit is the largest of the class, as well as of superior quality. With liberal culture and judicious pruning it will, very surely, prove eminently satisfactory, whether for family or commercial planting.

Downing, though scarcely equaling the Smith, in either size or quality, is yet so sturdy and vigorous, and withal so productive, and the fruit so large and of even size, that it is very generally preferred for commercial planting.

Industry is an imported variety of *R. grossularia*, which has been considerably disseminated, as being less liable to mildew than others of its species, but several seasons' experience with it, at this place, fail to warrant such claim.

CHERRIES, *Prunus*.

Of this fruit, the Mazzard varieties succeed so imperfectly in Michigan that only a comparatively limited number of varieties of this have been planted. Selections for this purpose have been more largely made of Dukes and Morellos, among them being several of the comparatively recent, and supposed hardy varieties imported by Prof. J. L. BUDD of Iowa, from northeastern Europe several of which are apparently identical in habit of growth with the Morellos. Others are designated as belonging to *families*; among which are *griottes*, *ostheims* and others, rarely planted in this country; some of them corresponding, in habit of growth, with the Morellos, while others show the Duke habit or are possibly intermediate in this particular.

The only insect which has proved especially troublesome, this season, is the cherry slug (*Selandria cerasi*), fresh colonies of which have rapidly followed each other down to the latter half of September or the beginning of October.

Little if any injury has been observed from the attacks of fungi.

CHERRIES.

Number.	Name.	Date of planting.	Class or species.	Date of blooming.	Remarks.
1	Abbesse de Oignies	1888	Russian	May 25.	A moderate or poor grower, so far.
2	Belle de Choisey	1888	Duke.	" 20.	Beautiful; excellent; a thin bearer.
3	Belle Magnifique	1888	Duke.	" 25.	Ripens quite late.
4	Bessarabian	1888	Russian	" 18.	Imported by Prof. J. L. Budd, of Iowa.
5	Black Eagle	1888	Mazzard.	" 15.	Excellent; not an early bearer.
6	Black Tartarian	1888	Mazzard	" 14.	Very large and showy; tree very upright.
7	Coe's Transparent	1888	Mazzard	" 13.	Said to be the finest sweet cherry.
8	Downer's Late	1888	Mazzard	" 12.	Very hardy for a Mazzard.
9	Duchesse d'Angouleme	1888	Russian	" 22.	One of Prof. Budd's importations.
10	Early Richmond	1888	Morello.	" 12.	A popular early sour cherry.
11	Eugenie	1888	Duke	" 13.	A comparatively recent French variety.
12	Frauentorfer Weichsel	1888	Russian	" 15.	The name would indicate German origin.
13	Griotte du Nord	1888	Russian	" 22.	The name is suggestive of French origin.
14	Louis Philippe	1888	Morello.	" 12.	Late; large; culinary.
15	Lutovka	1888	Russian	" 19.	Received from Prof. Budd.
16	May Duke	1888	Duke	" 14.	The type of this family of cherries.
17	Montmorency	1888	Morello.	" 18.	Possibly the same as Montmorency Ordinaire.
18	Olivet	1888	Duke.	" 13.	A recent introduction.
19	Ostheim	1888	Russian	" 14.	Received from Prof. J. L. Budd.
20	Reine Hortense	1888	Duke.	" 14.	Large; one of the finest of the Dukes.
21	Skianka	1888	Russian	" 14.	From Prof. Budd.
22	Yellow Spanish	1888	Mazzard	" 14.	Excellent; inclined to crack and rot.

This sub-station now has forty three varieties of cherry planted and growing upon the premises, of which, however, a considerable number were only planted the past spring.

Downing and the older pomologists designate the tender-fleshed sweet or Mazzard cherries as Hearts; and those of firm or breaking texture as Bigarreaux; but, with the extensive modern originations of this fruit, these have been so crossed or interbred, that the line of demarcation—never very distinct—is no longer surely traceable; and in view of this difficulty, Mazzard—the name of the original wild type—is employed in the foregoing table to designate the entire species.

It may further be found that the advent of the recently improved Russian varieties may so fill the gap between the Dukes and Morellos that the dividing may become rather imaginary than real.

Short notices are appended, of a few of the more valuable varieties, arranged in two classes, in the order of ripening. The sweet or Mazzard varieties being adapted to favorable localities only; and the more hardy Dukes and Morellos suitable for more general planting, for either home use or market.

SWEET OR MAZZARD CHERRIES.

Early Purple, beginning of June. This is not unfrequently in eatable condition as early as June 1 in southern Michigan. The tree is less vigorous but harder than the average of the species. It bears early and abundantly. Fruit very dark, nearly black; of good medium size and fair quality.

Coe's Transparent, middle of June, is one of the most beautiful and excellent of this class of cherries. The tree is vigorous and productive, and the fruit of large size, ripening nearly with earliest acid cherries; color pale yellow with a rich blush.

Black Tartarian, middle of June, is one of the most vigorous, upright and productive trees of its class. Fruit very dark, almost black, when fully ripe. Although not of the highest quality, its large size, showy appearance and firmness, render it desirable, whether for home use or for market.

Sparhawk (Honey), end of June. Tree very vigorous and productive when of mature age. Fruit of medium size, bright red, and of rich flavor.

Yellow Spanish, end of June. This is the type of the firm fleshed or Bigarreau class of cherries. Fruit very large, yellow with a rich blush, and the highest flavored of the sweet cherries. Unfortunately it is very liable to crack and decay, when warm, moist weather occurs during the ripening season.

Black Eagle, beginning of July. Tree vigorous, upright, spreading, very productive when of mature age. Fruit of fully medium size; very sweet, black. One of the best of the sweet cherries.

Downer's State, beginning of July. Tree vigorous, rather upright, exceedingly hardy and productive. Fruit large, bright red and will hang long after maturity. Very valuable whether for home use or market.

Powhatan, middle of July. One of the numerous seedlings originated in Ohio by the late Dr. Kirtland; late ripening, large size, and productiveness conspire to render it valuable, whether for home use or market.

DUKE AND MORELLO CHERRIES.

Belle de Choisey, middle of June. Tree upright, and moderately vigorous, but only moderately productive. The fruit is of fully medium size, and in beautiful appearance and real excellence, it has scarcely an equal among cherries.

Early Richmond, middle of June. Is a leading culinary variety whether for the kitchen or market. Description therefore seems unnecessary.

May Duke, middle of June. Is the type of its class. It is scarcely as hardy as the Morellos; but where it succeeds, it can scarcely fail to be profitable. When fully ripe it is excellent, even as a dessert fruit.

Montmorency Ordinaire, end of June. Tree a vigorous grower, hardy, productive. Fruit medium size, mild acid, a good culinary variety.

Late Duke, middle of July. Tree has much the habit of May Duke; fruit being much later, is the more desirable on that account.

Louis Phillippe, end of July. Tree a vigorous grower, for a Morello. Its large size and high flavor render it valuable for culinary use.

Belle Magnifique, beginning of August. Is a hardy, vigorous and healthy tree. Fruit of fine size and good flavor for culinary purposes; and when well ripened, is desirable for the dessert.

MULBERRIES, *Morus*.

Although the Mulberry is indigenous to Michigan, it has rarely been planted for economical purposes, until within recent years.

Since the fruit ripens in succession, during a considerable period, and is dropped as soon as mature, only small quantities can be secured at any single picking.

Seedlings of improved size and quality have now been several years before the public, yielding their fruit through a considerably longer period; and, for this reason, designated as everbearing.

Birds are so fond of this fruit that, while this is in season, other fruits ripening at the same season partially escape their attacks; for which reason it is sometimes recommended to plant this as a protection.

The following varieties are on trial here:

Downing, planted in 1888, is a seedling of the *multicaulis* (an imported variety, not quite hardy, even in southern Michigan), producing abundant crops of large and superior fruit; ripening in succession, through a considerable period.

Hicks, planted in 1890, is from Kentucky, and said to be similar to the foregoing.

New American, planted in 1888, is quite distinct in habit, and apparently somewhat more hardy; although both this and the Downing were seriously injured by the past winter—an unusual occurrence.

Russian, planted in 1885, proves to be of two varieties; the one with dark purple fruit, and the other pale yellow. The trees are of spreading, almost drooping habit, very hardy and productive. The fruit is worthless.

Teas' Weeping, planted in 1889, is a chance seedling, originating in Missouri. The habit is decidedly weeping, and the lobed, glossy foliage attractive. Grafted at standard height, upon a hardy stock, it makes a beautiful lawn tree.

SERVICE BERRY, *Amelanchier*.

Known also as June Berry, Shad Bush; and (erroneously or fraudulently) occasionally as Huckleberry.

The dwarf varieties, only, are on trial here.

Common Dwarf Service Berry, of the west, planted in 1876, forms a bush two or three feet in height, producing rather light crops of fruit, of size and general appearance of the huckleberry, though lacking the rich flavor of the finer varieties of that fruit. It is a special favorite with the birds.

Success, planted in 1890, is also a dwarf variety, originating upon the mountains of Pennsylvania, and said to be more productive than the foregoing.

THE PEACH, *Prunus Persica*.

Of this fruit thirty-seven varieties were planted during the spring of 1888; and the most, if not all, of these would very probably have shown fruit this season, but for the warmth of last winter, which, in many cases, occasioned the development of the fruit buds, almost to bursting, followed by a sudden freeze, early in March, which ran the thermometer down to ten or twelve degrees, ruining the buds of the less hardy fruits.

During the past spring sixty-five additional varieties have been planted, generally two trees of each, though, in a few cases, a single tree only has been obtained, in which case a vacancy was left for the additional one needed. The vacancies from this cause, together with a few losses, number fifteen, which should be supplied next spring.

Until the identity of varieties can be assured by the production of fruit, all attempt at tabulation, as well as the suggestion of lists for planting, is omitted.

The trees have not suffered this season from attacks of fungi, with the exception of leaf curl, *Taphrina deformans* developed apparently by cold wet weather, occurring while the foliage was yet in a tender and growing

condition. Although the trees suffered a temporary check from this cause, new and healthy foliage soon appeared and growth was resumed.

The peach borer (*Ægeria exitiosa*), was looked after during last spring, but none were discovered. Another examination in September brought more or less of them to light; the greater number occurring, as seemed to be usually the case, on the lightest soils.

GRAPES, *Vitis*.

Of these, forty-three varieties were planted in the spring of 1888; the same number in 1889, and forty in 1890—a total of one hundred and twenty-six varieties. Of these, thirty-eight varieties are black or nearly so; thirty are classed as red varieties, and thirty-four are white, yellow, or green in color when mature. Of nineteen varieties, not yet fruited here, the color is not known.

Of those planted in 1888 and 1889, thirty-nine varieties have shown more or less fruit this season, and the following is a tabular list of such, with results of the present year's experience, together with such further particulars as are deemed warrantable from that of the past.

It should be noted, however, that there is unavoidably more or less uncertainty as to season of ripening, and perchance as to the estimate of quality also, since it became necessary to gather the fruit of several varieties before full maturity, to avoid their entire loss by pilfering.

Insect attacks have not proved troublesome upon either plants or fruit this season.

Late in the season, numerous small, dark spots appeared upon the foliage of several varieties, due, probably to mildew. No injury to the fruit was observed, although, when gathered, slight attacks of mildew were discovered upon the stems of a few clusters of Brighton.

Many of the varieties here tabulated were originally disseminated under numbers appended to the name of the originator or introducer, and (as in the case of the Rogers hybrids) a very common practice has been to retain them, attached to the name, as subsequently given. As these are no longer needed, they are omitted.

GRAPES.

ABBREVIATIONS.

Species.	Fungi.	Bunch.
A. <i>Festivalis</i> .	A. Anthracnose, <i>Sphaceloma ampellinum</i> (De By).	Size.
C. Cross.	B. Black Rot, <i>Laestadia Bidwellii</i> (Sacc).	l. large.
H. Hybrid.	D. Downy Mildew, <i>Peronospora viticola</i> (De By).	m. medium.
L. Labrusca.	P. Powdery Mildew, <i>Uncinula spiralis</i> (B. and C).	s. small.
R. Riparia.		Form.
		c. compact.
		l. long.
		m. medium.
		o. open.
		s. short.
		sh. shouldered.

Number.	Name.	Plant.						Fruit.									
		When Planted.	Species.	Vigor, 1 to 10.	Hardness, 1 to 10.	Productiveness, 1 to 10.	Date of Bloom.	Fungi.	Bunch.		Berry.		Color.	Bloom.	Pulp.	Flavor.	
									Size.	Form.	Size.	Form.					
1	Agawam.....	1888	H	10	8	10	June 24	B?	m	s sh	l	r	dr	---	s	s	
2	Aminia.....	1888	H	9	8	9	" 23	---	m	c sh	ml	o	dp	b w	s	sv	
3	August Giant.....	1889	H	10	9	10	" 23	---	l	l sh	l	r	b	b	s	sv	
4	Barry.....	1888	H	8	9	10	" 24	---	l	s c	l	r	r	b	s	s	
5	Brighton.....	1888	H	9	7	9	" 25	D	ml	s sh	ml	r	b	l s b	s	sf	
6	Champion.....	1889	L	9	10	10	" 24	---	l	sh c	m	r	b	b	t	sf	
7	Chidester No. 1.....	1888	L	7	9	4	" 24	---	---	---	m	r	p	w	t	sv	
8	Concord.....	1888	L	10	10	10	" 24	---	l	c sh	m	r	b	b	t	svf	
9	Delaware.....	1888	H	7	10	10	" 24	---	s	c sh	s	r	r	w	s	sv	
10	Diana.....	1888	L	9	10	9	" 22	---	s m	s c	m s	r	r	w	m	sf	
11	Duchess.....	1888	H	7	6	7	" 27	---	l	l c sh	m	r	w	w	s	s	
12	Early Victor.....	1888	L	8	10	6	" 22	---	m	c sh	m	r	b	b	m	sv	
13	Eaton.....	1888	L	9	10	---	" 27	---	l	l c sh	l	r	b	b	t	v	
14	Empire State.....	1888	L C	8	9	4	" 26	P?	l	c l	m	r	g w	w	s b	v	
15	Emuelan.....	1888	A	7	10	5	" 27	---	l	l c sh	m	r	b	b	m	vs	
16	Excelsior.....	1888	H	6	6	5	" 24	---	l	c sh	m	ro	r	w	s	vs	
17	Hayes.....	1888	L	6	9	7	" 27	---	l	c m	m	r	w y	w	s	s	
18	Herbert.....	1889	H	9	9	3	" 24	---	l	l sh	l	r	b	w	s	s	
19	Iona.....	1889	L	8	7	5	" 26	---	l	l sh	m	o	r	w	s b	vs	
20	Isabella.....	1888	L	10	9	3	" 24	---	l	o sh	ml	o	r b	b	m	vs	
21	Janesville.....	1889	L C	10	10	2	" 21	---	s	c	m	r	b	b	t	v	
22	Jessica.....	1888	H	6	7	3	" 24	---	m	---	s m	r	w	w	s	s	
23	Massasoit.....	1888	H	9	9	8	" 23	---	m	s sh	l	o	dr	g	s	s	
24	Merrimac.....	1888	H	9	9	8	" 24	---	s m	o	l	r	b	b	m	s	
25	Monroe.....	1889	L C	9	9	---	" 26	---	ml	c sh	l	r	b	w	m	v	
26	Moore's Early.....	1888	L	6	10	7	" 24	---	m	c	l	r	b	b	m	v	
27	Moyer.....	1888	H	7	8	---	" 23	---	---	---	m	r	r	w	s	sv	
28	Nectar.....	1888	L	8	8	---	" 27	---	---	---	l	r	r	b	b	s	
29	Niagara.....	1888	L C	10	10	10	" 24	---	l	c sh	ml	r	y w	w	s	s	
30	No. 50 (Caywood).....	1888	L	10	10	---	" 24	---	---	---	---	---	---	---	---	---	
31	Perkins.....	1889	L	10	10	10	" 22	---	ml	c sh	m	o	l r	w	t	s	
32	Pocklington.....	1888	L	7	10	8	" 26	---	l	c sh	l	r	gy	w	s	s	
33	Rogers' No. 8.....	1889	H	9	9	---	" 24	---	l	s	l	r	r	---	s	s	
34	Salem.....	1888	H	9	9	10	" 24	---	l	c sh	l	r	dr	g	m	s	
35	Ulster.....	1888	L C	6	9	6	" 22	---	l	c sh	m	r	r	---	s	sv	
36	Wilder.....	1888	H	7	9	---	" 25	---	l	c sh	l	r	p b	b	s	sv	
37	Woodruff Red.....	1888	L C	9	10	5	" 24	---	l	c sh	l	r	dr	w b	m	sv	
38	Worden.....	1888	L	9	10	9	" 24	---	l	c sh	l	r	b	b	s	s	
39	Wyoming Red.....	1888	L	10	10	8	" 23	---	s	c	s m	r	r	---	s	sf	

From the experience and observation of this as well as of previous years, the following lists are suggested for the consideration of planters of this fruit.

To those who prize high quality, even with the penalty of somewhat diminished returns, and are willing to devote the needful care and labor, the following may be expected to yield satisfactory results:

GRAPES.—Continued.

ABBREVIATIONS.—Continued.

Berry.		Form.	Color.	Bloom.	Pulp.	Flavor.	Quality.
Size.			b. black.	b. blue.	a. astringent.	a. acid.	b. best.
l. large.		o. oval.	d. dark.	g. gray.	b. breaking.	f. foxy.	g. good.
m. medium.		r. round.	g. green.	l. lilac.	m. medium.	m. mild.	v. very.
s. small.			l. lilac.	p. purple.	s. soft.	s. sweet.	
			p. purple.	t. thin.	t. tough.	v. vinous.	
			r. red.	w. white.			
			w. white.				
			y. yellow.				

Number.	Quality.	Date of ripening in 1890.		Remarks.
1	v g	Oct.	1	This has a thick, tough skin, and is valued as a long keeper.
2	v g	Sept.	25	Valued as one of the most desirable of the Rogers hybrids.
3	v g	"	"	Very vigorous, fruit very large. Its actual value yet undetermined.
4	v g	"	22	Earlier than Concord; very productive; keeps well.
5	b	"	17	One of the best and most beautiful of table grapes, very valuable.
6	g	"	1	Very early, hardy and productive; but very low in quality.
7	g	"	15	A trial variety, not yet for sale; quality excellent.
8	"	"	27	Too well known to need description. Productive, poor in flavor.
9	g	"	14	Fruit small. As a dessert grape, has few if any superiors.
10	g	"	30	Ripens late. Sweet, foxy. A good keeper.
11	b	"	17	Said to keep well. Of superior quality. Vine liable to mildew.
12	v g	"	12	Very promising, early, productive, and likely to prove valuable.
13	"	Oct.	1	Much like Concord; but larger in both bunch and berry.
14	b	Sept.	29	Of fine appearance and superior quality. Needs a longer test.
15	v g	"	15	One of the finest; but often fails to set a good crop of fruit.
16	b	Oct.	8	One of the finest dessert grapes, where sure to ripen.
17	v g	Sept.	18	A pure, native, white grape, of excellent quality for the table.
18	v g	"	13	Early and valuable. Vine, vigorous, healthy and hardy.
19	b	Oct.	4	In beauty and real excellence this is a prince among grapes.
20	v g	Sept.	30	The oldest of the native varieties. Still valued where it will ripen.
21	g	"	6	Valuable where superior hardiness is requisite. Vigorous.
22	v g	"	16	A new white, very early grape of Canadian origin.
23	v g	"	22	A Rogers hybrid, ripening quite early. Generally valued.
24	v g	"	22	A generally popular and reliable, hybrid variety.
25	v g	"	27	Originated at Rochester, N. Y. Worthy of more attention.
26	g	"	8	Valuable chiefly for earliness and great hardiness.
27	v g	"	6	A recent Canadian variety, approaching Delaware in appearance.
28	b	"	"	An excellent variety, originated by the late A. J. Caywood.
29	g	"	24	The leading market white grape, now well and generally known.
30	-----	"	20	Not yet for sale. Vine very vigorous and healthy.
31	g	"	14	Unworthy. Chiefly valued for earliness and hardiness.
32	v g	"	28	Very promising. Hardly yet generally known or appreciated.
33	v g	"	21	Although yet unnamed, this compares well with its fellows.
34	v g	"	25	Its great vigor and large and abundant fruit, render it popular.
35	b	"	22	Excellent for dessert. Value for market yet undetermined.
36	v g	"	19	One of the most valuable of the Rogers hybrids.
37	g	"	"	Its vigor, hardiness and productiveness, render it popular.
38	v g	"	18	Larger and better than Concord, which it is superseding.
39	g	"	20	Of doubtful value compared with others of its class and season.

Jessica, Lady, Early Victor, Delaware, Brighton, and Empire State; and on suitable soils, and when the season will suffice to mature them, Iona and Excelsior.

For planters who require varieties which will mainly "take care of themselves" and still yield at least some returns, even though of lower quality:

Lady, Moore's Early, Worden, Hayes, Niagara, with Isabella when the season will suffice to ripen it.

For the market grower who wishes to work for customers who value quality, and are able and willing to pay for it:

Early Victor, Delaware, Brighton, Ulster.

For growers for average city or village customers who generally, "buy by the eye:"

Moore's Early, Worden, Concord, Niagara.

THE PLUM, *Prunus*.

Of this fruit seventeen varieties were planted in the spring of 1888, several of which bloomed this season, but failed to produce fruit.

Fifty-nine additional varieties were planted last spring. Including both plantings the list embraces the following:

Of *P. Domestica* (the garden or European species), thirty-five varieties.

Of *P. Americana* (the native wild plum of the north), eighteen varieties.

Of *P. Chicasa* (the native plum of the southwest), seven varieties.

Of the recently introduced Japan species, fifteen varieties.

Also Pissard, which is an alleged variety of the Cherry plum (*Myrobolan*).

Six of the varieties imported by Prof. J. L. Budd, of which trees were received from him, are included among the varieties of *domestica* as given above.

So large and varied a collection has been gathered with the purpose to supply the means of observing their comparative ability to resist the various maladies to which, in our climate, both tree and fruit have proved liable, with the hope to discover, among them, varieties, or possibly species, adapted to profitable cultivation here, where the cultivation of this fruit has, for many years, been practically abandoned.

Another, though incidental, object has been to provide a collection upon which the varying results of the use of insecticides and fungicides, as well as other appliances, upon the several species and varieties, can be satisfactorily observed and compared, with at least the possibility that such wider field of experiment and observation may evolve processes or varieties, one or both, by means of which the old-time success of plum culture in southern Michigan may be at least partially renewed.

As in the case of all the tree fruits, planted during last spring, two adjacent trees have been planted of each variety, so far as trees were at hand, and vacancies left, where trees were lacking, to be subsequently filled.

Of those planted last spring, four trees have died, those being from a lot received from Georgia during the blizzard of last March, which ruined the fruit crops of this region.

Vacancies were also left for the fifteen lacking trees, making nineteen vacancies to be filled, to supply nearly all which we now have trees of our own growth.

The only insect which has proved troublesome upon the plum this season is the slug (*Selandria cerasi*), which has proved unusually persistent, new colonies having made their appearance as late as the middle of September.

The fungus known in common parlance as plum pockets, or plum bladders (*Taphrina pruni*, Fckl.), which usually attacks the fruit, developed on

several trees of *Chicasa* varieties received from Missouri and Iowa nurseries, manifesting itself in enlargements of the young growing shoots. These were promptly cut away and burned. Later in the season they have ceased to appear.

In a few cases there has been a premature though slight loss of foliage, caused, as may be inferred, by attacks of fungi. These have, in no case, however, proved so serious as to perceptibly enfeeble the trees.

PEARS, *Pyrus communis*.

Of this fruit there are now fifty varieties growing upon the premises; all standards.

Twenty-four varieties were planted in 1888, comprising forty-five trees.

Sixteen additional trees, including twelve varieties, were planted in the spring of 1889.

The remaining fourteen varieties were procured in the spring of the present year, of which four varieties only were planted in orchard, for the reason that the ground intended for them was occupied by the trial plant of strawberries. The remaining trees were therefore planted in nursery and cut back to the proper height to commence the formation of heads, the purpose being to have the ground in readiness to receive them next spring. The number of trees in nursery as above stated is twenty-eight; making the whole number of trees ninety-three, none of which have yet shown fruit.

Of insects none have proved troublesome excepting the slug (*Selandria cerasi*) which has been unusually persistent, commencing its depredations as early as usual, and renewing its attacks from time to time down to the beginning of October. Although yielding readily to applications of insecticides, constantly renewed attacks have compelled frequent reapplications.

A fungus, supposed to be that usually known as scab (*Morthiera Mespili* Feckl.) has attacked the leaves and even the tips of the young shoots of a few trees, to such an extent as to considerably check their growth.

Planters desiring a succession of this fruit, of high quality, and willing to secure it by means of intelligent and careful treatment, will find the following list of varieties adapted to such purpose. The varieties are named, as nearly as practicable, in the order of their ripening:

Summer Doyenne, Giffard, Bloodgood, Tyson, Rostiezer, Clapp's Favorite, Howell, Bosc, Anjou, Winter Nelis, Dana's Hovey; and Pound if a variety is desired especially for culinary uses.

For the average of small planters, the following will afford a partial succession of vigorous and productive varieties of fair quality:

Summer Doyenne, Clapp's Favorite, Bartlett, Sheldon, Howell, Onondaga, Anjou, Lawrence.

Market list, affording a succession: Summer Doyenne, Tyson, Sterling, Clapp's Favorite, Bartlett, Howell, Onondaga, Bosc, Anjou, Lawrence.

APPLES, *Pyrus malus*.

The entire planting of apples comprises one hundred and twenty-one varieties.

The planting of 1888 (which was the first), consisted of ninety-seven trees of fifty-six varieties. Of these sixteen trees (nearly all Northern

Spy's planted for such purpose) have been top-grafted with trial varieties received in scion, from various sources.

Four trees of four varieties were received from the station at the Agricultural college and planted in the spring of 1889.

The plat planted in the spring of 1890, upon the state land, consists of one hundred and eight trees of fifty-four varieties; of these, three trees have failed.

Forty-two surplus trees, of varieties already planted, which were largely donated, have been planted as stocks. Of these, seventeen have been top-grafted with scions of trial varieties not obtainable as trees; all being in growing condition, excepting two only, which were broken down and ruined by trespassing stock. Eleven others were also budded with new trial varieties, of which buds were received in August.

A few aphides were observed at one time, but not in sufficient numbers to require special attention. Aside from these, neither insects nor fungi have proved troublesome upon the apple.

QUINCES, *Cydonia*.

Seven varieties of this fruit have now been planted as follows:

Champion, Meech, Orange and Rea were planted in 1888.

Hong Kong, Missouri Mammoth, and Angers, in 1890.

Champion is the only one of these that has yet borne, producing a few fruits the present year, which ripened early in October, although in most seasons it fails to fully ripen here.

The slug (*Selandria cerasi*) has been especially persistent in its attacks upon the foliage; aside from which, insects have not been troublesome.

The foliage of several plants, mainly of the Orange quince, has been nearly ruined by apparently the same fungus which attacks that of the pear, probably *Morthiera Mespili*; which in a few cases has wholly arrested the growth.

Another fungus was discovered in July last upon the young shoots, causing a peculiar enlargement thereof. Specimens of this were sent to Prof. TAFT, at the Agricultural college, who identified it as one of the red rusts, *Roestelia aurantiaca*, Peck. These were promptly cut away and burned. They did not appear in number sufficient to prove especially injurious.

NUTS.

CHESTNUTS, *Castanea vesca*.

Quite recently, the chestnut has come to attract a good deal of attention, occasioned, apparently, by the introduction of the European, or so-called Spanish chestnut; and the more recent importation of the very large, early bearing, Japanese varieties. This tendency has also, no doubt, been emphasized by the discovery and introduction of the Paragon—supposed to be an improved native; or, possibly, a cross between the native and the foreign.

There being, apparently, more or less uncertainty respecting the nomenclature of these introductions, as well as uncertainty respecting their adaptability to our climates and soils, as a means of aiding the solution of these problems, the following have been procured and planted:

Hathaway Chestnut—Root grafted—A very large native seedling, by B. Hathaway of Cass county, Michigan, planted in the spring of 1890.

Seedlings from the foregoing, planted in the spring of 1889.

Japan Chestnut seedlings, planted in the spring of 1890.

Japan Chestnut, grafted, planted in the spring of 1890.

Japan Chestnut, home grafted, planted in the spring of 1890.

Japan Chestnut, imported grafted, planted in the spring of 1890.

Japan Sweet Chestnut, planted in the spring of 1890.

Paragon Chestnut, planted in the spring of 1888, has produced fruit the present year. Additional trees of this were planted in the spring of 1890.

Spanish Chestnut, planted in the spring of 1890.

EUROPEAN WALNUT, *Juglans Regia*.

This is popularly known as Madeira nut. Two trees were planted in the spring of 1889 and left without protection through the past winter. One of these proved to be dead this spring, while the other survived, and has made a moderate growth the present season.

Præparturiens, is a dwarf variety of the foregoing, of which trees were planted in the spring of 1890.

JAPAN WALNUT.

Plants of this were procured and planted in the spring of 1890. Although, of course, they have not shown fruit, the foliage and the habit of growth indicate that they are, at least, very closely allied to our native Butternut (*Juglans cinerea*).

PECAN, *Carya oliviformis*.

Seedling plants of this were procured and planted in the spring of 1888; but, failing to grow, seeds were procured from southeastern Iowa, through the good offices of Col. G. B. Brackett of that state, being the northern limit of the indigenous growth of this nut. These nuts were planted in the fall of 1888, where the plants are intended to permanently remain. The plants were left unprotected and came through the past winter uninjured, making a moderate, healthy growth the past summer.

CHINQUAPIN, *Castanea pumila*.

Failing to secure plants of this last spring, seeds have been obtained the present fall and planted in nursery.

ASPARAGUS, *Asparagus officinalis*.

Owing to the diœcious character of the flowers, many persons doubt the existence of distinct varieties of this plant, save as the result of a continuous selection of seedlings with reference to a definite type.

It is also considered desirable to avoid the annoyance of young seedlings among older plants, by the selection of non-seedling (male) plants. As this involves a doubt as to the success of old plants, as compared with those one or two years of age, six alleged varieties have been planted during the present year and duplicates of two of these have been planted of crowns taken from old beds of the same varieties.

The varieties planted are, Argenteuil, Barr's Mammoth, Conover's Mammoth, Moore's Cross-bred, and Palmetto.

RHUBARB, *Rheum Rhaponticum*.

Of this, six varieties have been planted during the present year, for purposes of comparison, as follows:

Early Crimson, Early Scarlet, Magnum Bonum, Myatt's Linnaeus, Prince Albert, and Victoria.

The practice, among originators, of allowing new fruits to go out unnamed, and under numbers only, or with numbers appended to the name of the originators, is obviously an increasing one, as appears from reports already published; and such indications will be found to be much more pronounced, in the list of varieties recently planted. The American Pomological society, in its "Rules of Pomology" (by implication at least), forbids such practice. The inappropriateness of such names is, no doubt, obnoxious to all, while thereby the liability to errors of nomenclature is considerably increased. Under the circumstances, therefore, I venture the suggestion, that a combination of fruit-testing stations, as well as of societies and individuals, be effected, pledged to refuse recognition or publication of new varieties, except under names not open to this or similar objections.

All of which is respectfully submitted.

SOUTH HAVEN, MICH., }
October 13, 1890. }

T. T. LYON,
Agent in charge.

VEGETABLES—VARIETIES AND METHODS.

By L. R. TAFT. Bulletin No. 70, Horticultural Department.

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During the past summer we have grown in the garden, forcing-house, or hotbeds, many of the new varieties of vegetable that are being offered to the public, together with many of the standard sorts, for purposes of comparison.

In this bulletin will be found in tabular form a considerable amount of data that has been collected, regarding some of the more important vegetables, together with brief notes and a summary of the results obtained.

So far as was possible under the circumstances, we have made tests of various methods of planting, cultivating, and training the different plants, and have tested the effects of different fertilizers. The results will be found in connection with the plants used in the experiments.

BEANS.

Fifty-four varieties were planted on the 28th day of May. Two hundred beans were planted in a space ten feet long, with three feet between rows. After germination each variety was thinned to sixty stalks. The following table shows the comparison:

TABLE 1.—*Beans planted May 28.*

Number.	Variety.	Seedsman.	Per cent of germination in tester.	Per cent of vegetation in soil.	Number of days to vegetation.	Number of days to bloom.	Number of days to edible maturity.	Number of days to marketable maturity.	Number of days to ripening.	Number of pods.	Weight of beans shelled, in ounces.
1	Best Dwarf	Maule	99	84	6	39	54	58	92		
2	Best Dwarf	Ely	99	93	6	43	52	54	94	167	3.75
3	Best Dwarf	Burpee	85	81	6	36	50	52	80	218	4.00
4	Blue Poddad Butter		97	93	6	35	48	51	69	212	3.00
5	Burlingame	Maule	92	95	5	36	48	51	72	308	13.90
6	Canadian	Ely	100	81	7	43	59	61			
7	Champion		95	70	7	38	49	51	80	110	2.45
8	Sion House	Dreer	81	78	7	38	49	52	80	408	9.50
9	Cylinder Black Wax	Hend.	100	77	7	39	50	51	80	165	3.45
10	Date Wax	Dreer	91	78	7	36	48	49	72	114	4.10
11	Date Wax	Ferry	95	77	7	36	47	51	71	207	4.30
12	Detroit Wax		94	63	7	36	48	49	80	128	2.40
13	Red Valentine	Hend.	100	74	7	36	47	49	80	202	5.50
14	Earliest Dwarf	Maule	100	91	5	36	47	48	70	222	3.84
15	Emperor William	Vaughan	88	60	7	35	47	48	69	183	2.88
16	Violet Flageolet	Ferry	96	41	5	38	47	49	80	130	3.10
17	Goddard	Ely	99	78	7	41	52	54	92	87	1.07
18	Tree	Maule	88	68	7	57	110	114			
19	Jack Hatt, No. 1, white	Hatt	85	64	7	38	52	54	92		
20	Jack Hatt, No. 2, "		95	69	6	38	48	51	80	242	6.70
21	Jack Hatt, No. 1, black		99	92	6	38	49	51	92		
22	Long Six-weeks	Hend.	100	96	7	36	47	49	72	205	5.90
23	Champion	"		86	7	38	48	50	80	136	3.50
24	Mammoth Wax		84	54	7	39	47	49	80	186	7.05
25	Butter Wax	Maule	93	86	6	35	47	49	81	231	5.50
26	Mont d'Or	Ely	98	88	7	36	49	51	80	230	3.25
27	Golden Refugee	Maule	98	88	7	43	54	56	94		
28	Ne Plus Ultra	Ely	98	95	6	35	47	49	70	320	9.82
29	Perfection Wax	Burpee	84	46	8	38	48	50	82	234	5.08
30	Saddle-back Wax			90	7	35	45	48	73	387	9.00
31	Rust Proof	Vaughan	90	87	7	32	44	47	69	238	7.12
32	Dakota Soap	Maule	88	98	7	36	46	48	72	285	6.89
33	Golden-Eyed Wax	Hend.	98	90	7	42	45	48	72	274	6.31
34	Golden Cluster	Ferry	100	98	7	90	101	105			
35	First Market	Landreth	80	52	7	37	47	49	80	289	7.40
36	Everbearing Wax	Griswold	41	7	49	66	69				
37	Landreth Scarlet	Landreth	58	56	7	36	45	48	80	175	5.27
38	Paris Canner		44	44	7	38	52	54	87	661	11.47
39	Pink-Eye Wax	"	28	22	8	37	48	50	80	444	7.50
40	Saddle-back Wax	"		83	7	36	47	49	80	172	3.80
41											
42	Snow-flake	Greg	97	84	5	39	51	54	74	411	6.16
43	Refugee	Johnson & Stokes	88	6	36	45	48	69	368	10.52	
44	Wardwell	Salzer	42	9	37	47	48	80	255	9.37	
45	Perfection Wax	Dreer	71	46	7	36	47	49	80	155	3.62
46	Pickett No. 1		88	84	7	36	47	49	70	237	4.63
47											
48											
49	Pickett No. 2		96	85	7	35	45	47	70	204	4.74
50	Newtown	Thorburn	99	98	7	36	48	50	73	198	6.10
51	German Wax	Burpee	98	81	7	37	48	50	72	307	5.15
52	Yosemite	Hend.	87	76	7	36	48	50	92		
53	Black Wax	Hallock	94	85	6	36	47	48	72	300	6.89
54											
55											
56											
57	Aroostook	Jerrard		57	7	35	47	49	69	305	5.84
58	Jack Hatt, No. 1½	Hatt		84	6	44	54	56	80	388	6.57
59	Jack Hatt, No. 2½			80	6	39	50	52	80	270	8.15
60	Jack Hatt, No. 3	"		87	7	39	52	54	82	222	7.90

WAX SORTS.

Cylinder Black Wax—Hend. Growth strong, even; foliage yellowish green, leaflets large; pods light yellow, round, curved. Valuable for strong growth, productiveness, tender pods and freedom from rust. Synonyms (*Prolific German Wax*—Burpee, *Black Wax*—Hallock, *Pickett's No. 1.*)

Saddle-back Wax—Burpee. Seems to be a well-selected strain of Black Wax, and shows no evidence of a cross with Yosemite Mammoth as claimed.

Rust-proof (Currie's)—Vaughan. In growth of vine, and in pod, this variety closely resembles Black Wax. The bean is blue-black. It was first in earliness, but was not remarkably productive, nor free from rust, as its introducers claim.

Yosemite—Hend. Growth strong, nearly free from rust; pods yellow, long, much curved. Productive.

Mont d'Or—Ely. Growth rather small, considerable rust, pods yellow, round, tender, and well flavored. Quite productive.

Perfection Wax—Dreer. Growth rather small; foliage light green; considerable rust; pods yellow, long, usually curved. Bean large, flat, brownish-red.

Landreth Scarlet—Land. Appears identical with Perfection Wax, except that the bean is smaller, nearly round, and of lighter color.

Violet Flageolet—Ferry. Closely resembles Perfection Wax but of stronger growth, and beans of violet color.

Date Wax—Ferry. Similar in plant and pod to Perfection Wax. Bean is yellow-green with brown eye.

Mammoth Wax—Hend. (*Butter Wax*—Maule). Growth strong; foliage yellowish-green, leaflets large; little rust; bloom large, white; pods yellow, long, straight or curved. Valuable for even, strong growth, and for large tender pods.

Pickett's No. 2. Earlier than Mammoth Wax; growth smaller; affected with rust. Bean smaller, purple around eye.

Detroit Wax—Ferry. Growth medium; foliage light green; leaflets medium size; considerable rust; bloom small, white; pods golden yellow, long, broad, flesh thick. Bean medium size, round, white, with brownish-black eye.

Wardwell—Salzer. Growth rather small, uneven; foliage dark green; leaflets large; considerable rust; pods yellow, long, flat, usually twisted sidewise. Bean long, round, kidney shaped, white, dark brown around eye.

Saddle-back Wax—Land. Growth small; foliage yellowish-green; leaflets small; considerable rust; pods deep yellow, long, round, curved, crease in back; flesh thick. Bean medium size, white with purple-brown eye.

Pink-eye Wax—Land. Growth small; foliage dark green; leaflets small; some rust; pods hang in clusters, yellow, rather short, flat, largest at apex. Bean large, nearly round, white, with yellowish-pink eye; very productive.

Golden-eyed Wax—Hend. Growth medium; foliage light yellowish-green; leaflets medium size; some rust; pods yellow, short, flat, largest at apex. Bean medium size, white, with yellow eye. Earlier, but not so productive as Pink-eye Wax.

GREEN SORTS.

Champion—Ely. Growth, medium; foliage, dark green; leaflets small; considerable rust; bloom small, purplish pink; pods green, short, flat, broad, straight; bean, large, round, purple.

Canadian—Ely. Growth strong, upright; foliage, yellowish-green; leaflets very large; considerable rust; bloom large, light pink; pods green, long, wide, curved, point long; tender and of good quality. Bean very large, flattened, violet-purple color. A late variety.

Ne Plus Ultra—Ely. Growth, medium, compact; foliage, light yellowish green; leaflets large; badly rusted; pods green, 4-6 inches long, straight or slightly curved, flat, apex largest. Bean medium size, $\frac{1}{2}$ inch long, flattish, yellow color, eye darker. Prolific.

Dakota Soup—Maule. Growth, smaller than preceding; some rust; pods, 2 to 2 $\frac{1}{2}$ inches long, straight. Bean, small, round, dark yellow. An early variety.

Six-weeks—Hend. (*Newtown-Thor.*) Growth medium; foliage, yellowish-green; leaflets small; badly rusted; pods green, 4-6 inches long, curved; apex long, curved. Bean, large, brownish-yellow with darker eye.

Blue-podded Butter—Burpee. Growth small; foliage has a dark purple tinge; leaflets small; badly rusted; bloom large, dark purple; pods 4 inches long, $\frac{3}{4}$ inch wide, flat, purplish black, of good quality. Bean medium size, flat, pink with yellow eye.

Refugee—J. & S. Growth, medium; foliage, yellowish-green; leaflets, large; considerable rust; pods green, 4-5 inches long, round, curved. Bean small, blue with white spots. Early and productive.

Golden Refugee—Maule. Growth strong; foliage dark green; pods similar to preceding. Bean large, yellow-pink with purplish-blue spots. A late variety.

Best Dwarf—Burpee, Ely, Maule. Growth strong; foliage dark green; leaflets large, much wrinkled, considerable rust; pods green, 4-6 inches long, $\frac{1}{2}$ inch wide, tender and of good quality. Bean yellow-pink with purple spots.

Sion House—Dreer. Similar to preceding, but earlier and more productive.

Red Valentine—Hend. Growth strong; foliage yellowish-green; leaflets large; some rust; pods green, 4-5 inches long, round, curved. Productive. Not so early as claimed.

Earliest Dwarf—Maule. Growth small; foliage dark green; leaflets medium size; very badly rusted; pods dark green, 3-4 inches long, curved. Bean medium size, slightly flattened, white.

Emperor William—Vaughan. Growth medium; foliage yellowish-green. Bean large, flattened. Otherwise similar to preceding.

First Market—Land. Growth small; foliage dark green, edge of leaflets yellowish-green; pods green, 4-6 inches long, $\frac{5}{8}$ inch wide, curved sideways; some rust. Bean large, flat, white. Productive.

Paris Canner—Land. Growth medium; foliage dark green, leaflets large; a little rust; pods dark green, flat, curved, tender and of excellent quality, remain a long time in edible condition. Bean, greenish-white, flat, kidney-shaped. A very productive variety.

Goddard—Ely. Growth strong; foliage dark yellowish-green; some rust; pods green, 4-5 inches long, straight, flat. Bean very large, yellow-pink with red-brown spots. Valuable as a shell bean.

FIELD SORTS.

Aroostook—Jerrard. Growth small; foliage light, yellowish-green; leaflets small; considerable rust; pods green, 4-6 inches long, flat, curved.

Bean medium size, round, kidney-shaped, white. A desirable variety. Early.

Burlingame—Maule. Growth large, vigorous; leaflets small; some rust; pods light green, 3 inches long, straight, stringy. Bean medium size, round, white. Productive.

Snowflake—Greg. Growth strong, vigorous; foliage yellowish-green; leaflets small; considerable rust; pods green, 2-3 inches long, straight. Bean small, round, white. Valuable for productiveness.

Tree—Maule. Growth slender, spreading; leaflets very small; no rust. A very late variety and bears few pods.

The following varieties were obtained from Jack Hatt, Argentine, Mich.:

No. 1 1-2. Growth strong, upright; foliage dark green; leaflets small; very little rust; pods green, 4-5 inches long, flat, largest at apex, tender and of good quality. Bean medium size, white. Productive.

No. 2 1-2. Growth strong, reclining; foliage dark green; leaflets medium size; some rust; pods green, 3-4 inches long, straight, flat. Bean medium size, white, more flat than No. 1½.

No. 3. Growth strong, inclined to pole; foliage medium green; leaflets medium size; some rust; pods green, 4-6 inches long, flat, curved. Bean large, white; a good many are cracked.

The following short list of varieties will prove satisfactory for home or market use.

Wax beans—Cylinder Black Wax, Yosemite, Mammoth Wax and Pink-eye Wax. Green-podded varieties—Paris Canner, Ne Plus Ultra, Refugee, and Sion House.

For field bean—Aroostook, Burlingame, Snowflake, and Jack Hatt No. 1½.

BEETS.

Nine varieties of beet were planted May 12. One hundred seeds were sown in a row ten feet long, with a space of two and one-half feet between rows. After vegetation the beets were thinned to six inches apart.

TABLE II.

Number.	Variety.	Seedsman.	Per cent of germination in tester.	Number of plants from 100 seeds.	Per cent vigor.	Number of days to vegetation.	Number of days to edible maturity.	Remarks.
1	Dracena-leaved	Vaughan.....	58	39	5	13	....	Valuable only as a foliage plant.
2	Eclipse.....	Ferry.....	73	123	7.5	11	74	{ Diam. 3-3½ in., 2½ in. long; flesh—outer rings dark crimson, lighter in center.
3	Egyptian.....	".....	68	96	6	11	82	{ Diam. 3-4 in., length 2-2½ in., bottom flat; flesh dark crimson, little white.
4	Bassano.....	".....	77	127	8	11	74	{ Diam. 3-4 in., length 3 in., tap root 8 in. long; flesh white with narrow red rings.
5	Half-long Blood.....	".....	87	151	7	11	79	{ Diam. 2 in., length 10 to 12 in., flesh crimson with narrow rings of white.
6	Chilian.....	Vaughan.....	41	51	10	11	....	Valuable as a foliage plant.
7	Mitchell's Turnip.....	J. & S.....	67	73	7	11	84	{ Diam. 3 in., round, flesh pink-scarlet with white rings, firm.
8	Red Beauty.....	Salzer.....	81	146	8	11	79	{ Diam. 2½ in., length 3 in., flesh bright red with lighter streaks, firm.
9	Sample N.....	Burpee.....	72	137	9	10	74	{ Diam. 2½ in., length 10 to 12 in., flesh dark crimson with streaks of pinkish white, solid.

Eclipse, Bassano and Sample N were alike in earliness. Eclipse, because of its regular form and dark colored flesh, is better for a table beet. Bassano is preferable for greens.

Sample N is a new variety, valuable for earliness, large size, and regular form.

Half-long Blood is an excellent variety of the long-rooted type.

Egyptian has very dark flesh, but is somewhat irregular in form.

Mitchell's Turnip is a distinct variety but not so early as claimed.

Red Beauty, valuable for bright red color of flesh and regular form.

CABBAGES.

The seeds for the comparative test of varieties were obtained from the dealers whose names appear in the table. One hundred seeds were placed in our seed tester, and the results were noted.

On the 10th of March, 100 seeds of each variety were sown in shallow cigar boxes, and the number vegetating will be found in one of the columns of the table. Another column contains the number of days required by each variety for vegetation, and a third notes the strength of the plants. There is a striking correlation between these three columns.

The plants were pricked out in flats on the 27th of March, and were transplanted to the field on the 1st of May. Twenty-five plants of each sort were set on land that had been used for strawberries, and that had about twenty-five two-horse loads of stable manure plowed under in the fall. As the heads matured they were cut from one half the plants, and weighed, and the others were kept for noting the date of bursting, etc.

TABLE III.

Number.	Varieties.	Seedsman.	Percent germination in soil.	Percent vigor.	Days to vegetation.	From planting out.			Total perfect heads.	Average weight head, lbs.
						Days to first head.	Days to edible maturity.	Days to market maturity.		
1	All Head	Burp.			6	56	79	81	24	5.28
2	All the Year Round	Land.	66	70	6	60	87	142	23	3.79
3	All Seasons	Greg.	48	60	7	60	79	86	25	4.84
4	All Seasons	Vaug.	68	70	6	60	84	91	23	5.03
5	American Savoy	"	91	90	5	65	86	111	19	4.42
6	Autumn King	Hend.	88	85	5	62	91	151	21	8.52
7	Bridgeport	Vaug.	87	80	5	60	91	106	24	6.05
8	Cassel	"	76	80	7	60	81	84	24	3.11
9	Deep Head	Greg.	69	70	6	65	86	93	21	7.88
10	Earliest	Salz.	57	70	7	53	71	77	24	3.62
11	Earliest	Land.	95	90	5	53	71	74	23	3.16
12	E'y Jersey Wakefield	Everitt	75	70	8	65	83	86	24	3.04
13	E'y Jersey Wakefield	March	97	100	6	62	77	81	24	3.20
14	Early Summer	Vaug.	94	70	6	60	77	81	24	3.38
15	Etampes	"	69	60	7	58	78	82	21	2.71
16	Express	"	83	80	6	58	77	81	23	2.87
17	Fottler's Drumhead	"	92	85	5	65	82	86	21	3.68
18	Hard Head	Maule	49	50	8	67	86	93	24	7.04
19	Hyde Park	Gard.	48	40	8	60	84	124	24	8.34
20	Lightning	Salz.	53	80	6	53	72	77	24	3.91
21	Louisville Mammoth	Vaug.	67	80	7	62	86	125	23	8.22
22	Luxemburg	"	93	80	6	67	86	93	22	6.45
23	Diamond	J. & S.	27	40	8	65	82	89	24	4.90
24	Marblehead	Vaug.	80	90	5	69	105	142	21	8.22
25	Marvin's Savoy	Hal.	77	70	7	62	106	136	22	5.26
26	Market Gardener	Vaug.	90	90	5	62	76	118	24	5.34
27	Premium Flat Dutch	"	87	90	6	60	76	94	24	8.94
28	Red Drumhead	Gard.	77	90	6	67	81	142	22	7.15
29	Reynolds' Earliest	Greg.	81	90	5	53	71	74	23	4.85
30	Vandergaw	Gard.	50	70	8	60	81	86	24	4.46

Of the early varieties, Reynolds' Earliest is by far the best, being as early as any, and nearly one half larger. Salzer's Lightning was much like Landreth's Earliest, while the Earliest from Salzer differed but slightly in the form of the heads. The weights given as the average of each variety must not be too much relied on, as in each of the last three varieties the seed was not pure and several of the heads were off type; they are, however, approximately correct.

	Days required after transplanting.	Av. weight of heads, lbs.
Reynolds' Earliest.....	71-74	4.85
Landreth's Earliest.....	71-74	3.16
Salzer's Earliest.....	71-77	3.62
Salzer's Lightning.....	72-77	3.91

The Etampes and Express, which are practically the same, followed in about a week, but were nearly a pound lighter than the average of the others.

Early Wakefield, from Everitt, was very badly mixed.

Early Jersey Wakefield, *March*, matured with Etampes and gave heads considerably larger. Attention is called to the high per cent. of vegetation, and the vigor of the plants.

For some reason Early Summer and Fottler were rather light and failed to make their usual showing.

Of the sorts maturing with Fottler, All Seasons, All Head, and Vandergaw, made the following showing:

	Days.	Weight.
All Seasons—Vaughan	86-91	5.03
All Head—Burpee	79-81	5.20
Vandergaw—Gardiner	81-86	4.45

Deep Head and Hard Head were very firm and solid, and of good size; they may have their place.

Of the late sorts Premium Flat Dutch surpassed all others, with Hyde Park, Louisville, Autumn King, and Marblehead following closely.

	Days.	Weight.
Premium Flat Dutch	76 - 94	8.94
Hyee Park.....	84-124	8.31
Loudsville.....	86-125	8.22
Autuimn King.....	91-151	8.52
Marblehead.....	105-142	8.22

In this as in other tables, the number of days given in the first column, are the number from the date of transplanting to the field, to the edible maturity, and in the second to market maturity. For comparative purposes the last one should be used.

The weight was taken after the loose leaves had been removed.

From this year's trial, our list of four varieties for a succession would be, Reynolds, Early Summer, All Head or All Seasons, Premium Flat Dutch. Market Gardener, Hard Head, and Deep Head, are also good sorts to follow Early Summer.

Diamond does not make a very worthy showing.

Marvin Savoy is the best of its class, and Red Drumhead is also desirable.

SWEET CORN.

The varieties grown in the test plat numbered twenty-five, and consisted of the standard sorts and of such new ones as we could obtain. They were planted $3\frac{1}{2} \times 3$ feet, and 20 hills of each sort were grown, with five kernels in a hill. The number vegetating was noted and is given in the table. Although the planting was not done until the 26th of May, the soil was kept cold and wet by rain, for several weeks, and the stand was not perfect.

TABLE IV.

Number.	Variety.	Seedsman.	Percent vegeta- tion.	Days to vegeta- tion.	Days to bloom.	Days to edible maturity.	Days to market maturity.	Days until ripe.	Height—feet.	Length of ear— inches.
1	Amber Cream	Vaughan	42	8	44	77	86	112	5	7
2	Burbank	"	87	7	37	64	66	95	4 $\frac{1}{2}$	7
3	Cory	"	80	7	37	60	64	86	4 $\frac{1}{2}$	5
4	Crosby	"	82	7	37	66	72	98	5 $\frac{1}{2}$	6
5	Durkee	Gregory	78	8	37	68	70	101	4 $\frac{1}{2}$	5
6	Minnesota	Vaughan	57	7	37	68	72	107	5	7
7	Everbearing	Maule	64	7	33	75	79	107	6	8
8	Ford	Vaughan	80	7	37	65	68	95	5	6
9	Guarantee	J. & S.	83	8	42	75	79	107	5	8
10	Harbinger	Gardiner	58	7	37	60	64	95	4 $\frac{1}{2}$	6
11	Honey	Gregory	58	8	44	75	81	107	6 $\frac{1}{2}$	8
12	Mammoth	Vaughan	68	7	49	88	92	125	6 $\frac{1}{2}$	10
13	Leet	Ferry	75	7	37	65	68	98	5 $\frac{1}{2}$	7
14	Marblehead	Vaughan	76	7	37	60	65	86	4 $\frac{1}{2}$	6
15	Maule	Maule	63	8	42	70	72	107	6	7
16	Concord	Vaughan	81	7	42	68	72	107	7	8
17	Gold Coin	"	45	8	53	88	92	125	7	10
18	No. 48	Salzer	84	7	37	60	64	74	4 $\frac{1}{2}$	5
19	Old Colony	Vaughan	48	7	43	72	75	107	6	8
20	Pee and Kay	"	75	7	40	66	68	95	5 $\frac{1}{2}$	7
21	Perry	"	82	7	37	68	70	125	5 $\frac{1}{2}$	7
22	Shaker	"	65	7	43	66	81	107	5 $\frac{1}{2}$	8
23	Shoe Peg	J. & S.	42	7	51	88	92	119	5 $\frac{1}{2}$	6
24	Stabler	Burpee	68	7	45	75	81	125	6 $\frac{1}{2}$	8
25	Stowell	Vaughan	36	8	45	81	88	125	6 $\frac{1}{2}$	9

Of the extra early varieties there was no appreciable difference in time of ripening of Cory, Harbinger, Marblehead and No. 48 from Salzer; and following very closely came Burbank, Crosby, Minnesota, Ford, Leet, Pee and Kay, Perry and Shaker.

Amber Cream, Everbearing, Guarantee, Honey, Maule's XX, Old Colony, Concord, and Stabler would be classed as intermediate, and Late Mammoth, Gold Coin, Shoe Peg, and Stowell as late sorts.

EARLY VARIETIES.

Cory—The original Cory had a red cob and was several days ahead of Marblehead, but in our tests of this variety from ten different seedsmen we found that in most cases they had by selection secured white cobs, although that type was not fixed.

Harbinger—Much like Marblehead in size and general appearance. It may be a selected strain of that variety with eight-rowed ears, white cobs, and white kernels. Quite productive and of excellent quality.

Marblehead—For a long time, this has been the standard early variety and selected strains are still unsurpassed in earliness.

No. 48, Salzer—Could not be distinguished from Cory. Although not worthy of a varietal name it is one of the best strains of Cory grown by us this year.

Burbank—A very promising variety coming just after Cory. Cobs large, white; ears large 8 to 12 rowed; kernels large and nearly white. One of the most promising of the new varieties.

Crosby—Perhaps the best of the second early varieties, ripening a week after Cory. Cob white, 12 rowed, kernel small, evenly and closely arranged on cob. Quality excellent.

Minnesota—The favorite second early variety with market gardeners; ripens very evenly, kernels large and flat, very productive, but not equal in quality to Crosby.

Leet—This seems to be a well selected strain of Minnesota; although somewhat earlier than that variety, it has all its valuable characteristics developed to a high degree.

Ford—About four days later than Marblehead, ears long, slender, eight-rowed, cob white. Quite productive and of excellent quality.

Perry—Fully as early as Minnesota. Ears generally 10 or 12 rowed, with a slender white cob. Although no larger than Minnesota, its superior quality renders it valuable.

Pee and Kay—Ripens with the last. Ears 12-rowed. Kernels long, on a white slim cob.

Shaker—Ripens with Minnesota. Ears 10 to 12-rowed; cob white, of medium size, and an inch longer than Minnesota. Its size, productiveness, and excellent quality make it desirable as a second early variety.

Amber Cream—About a week earlier than Stowell. Ears very long and slender; 10 or 12-rowed. Cob white; kernels light amber when dry. Quality very good.

Everbearing—Although its evergreen character is the strongest point claimed for this variety, it was ripe nearly three weeks before Stabler, which was at edible maturity on the same day as Everbearing. Ears 10-rowed, size of Concord and Stabler; kernels and cobs white.

Guarantee—About with Everbearing in season and general appearance. Ears 8 inches long; cob white, slender. Very sweet.

Honey—One week later than Concord. Stalks about six and a half feet high; generally red. Ears 12-rowed, eight inches long. Quality excellent.

Maule's XX—Plants about six feet high. Ears six to seven inches long and 10 or 12 rowed. Kernels small and sweet. Not particularly desirable.

Old Colony—Stalks from five and a half to six feet high. Ears six to eight inches long; 14 to 16 rowed. About ten days earlier than Stowell. Cobs white; kernels long, small, and very sweet. One of the best in this class.

Concord—Plants about seven feet high. Ears eight inches long, 12 to 14-rowed. Kernels small but long. Very productive, and of excellent quality. Has few equals as a second early sort, and on account of its superior quality is by many preferred to Stowell for fall use.

Stabler—About a week earlier than Stowell which, in size and appearance of plant, it greatly resembles. The ears are a little smaller than those of Stowell, but are of better quality, and have the evergreen character developed to a high degree. This variety is preferred by many for general planting.

Late Mammoth—One of the largest varieties grown. A week later than Stowell. Probably a large, late strain of that variety.

Gold Coin—Much like the last in size, season, and appearance, except that the kernels are of a rich golden yellow. Instead of being ten days earlier than Stowell we find it a week later, or the same in season with Mammoth.

Stowell—This is the standard late variety. Vigorous, productive, ever-green to a high degree, and of fair quality. Although other varieties may be preferable in certain localities, the selection of Stowell as a late variety will not be a mistake.

Shoe Peg—(*Ne Plus Ultra, Quaker*). Stalks about 5½ feet high; ears small, five to six inches long; kernels long, pointed like a shoe peg, and placed thickly but irregularly over the cob. One of the latest to ripen. Its only value is in its superior quality, which may make it valuable for family use.

For a succession, the choice would be Cory or Marblehead, Crosby, Concord, Stabler and Gold Coin.

CUCUMBERS.

Nine varieties of cucumber were planted the 11th of June. They were planted in hills six feet apart each way. Ashes and turpentine, a half teaspoonful of turpentine to a pailful of ashes, applied every two or three days, proved an effectual remedy for the striped beetle.

TABLE V.

Number.	Variety.	Seedsman.	Percent of vege- tation in soil.	Number of days to vegetation.	Number of days to bloom.	No. of days to edi- ble maturity.	No. of days to ripening.	Remarks.
1	Boston Pickling,	Gardiner	45	4	25	46	56	Fruit 5-6 in. long; diam. 2-3 in., round, smooth, productive.
2	Chicago Pickling	Ferry	10	7	45	60	88	Fruit 4-5 in. long; diam. 3 in., smooth, vines weak, unproductive.
3	Long Green	"	55	4	33	55	59	Fruit 8-10 in. long; diam. 2½-3½ in., round, slightly ribbed, vines vigorous, productive.
4	Choice	Landreth	9	6	31	55	86	Fruit 8 in. long; diam. 1½ in., bent half double, vines weak.
5	Grecian	Maule	44	3	45	59	98	Fruit 10-14 in. long; diam. 3 in., smooth, solid, vines weak, not productive.
6	Parisian Pickling	Ferry	66	3	31	52	78	Fruit 10-12 in. long; diam. 1½-2 in., apex largest, curved, fairly productive.
7	Snake	Maule	32	4	42	66	---	Valuable only as a curiosity; vines died before fruit ripened.
8	Perfection	Salzer	8	7	41	64	107	Fruit 6-8 in. long; diam. 2½-3 in., smooth, perfect, vines vigorous, prolific.
9	Pearl	Burpee	21	4	41	66	98	Fruit 6 in. long; diam. 2½ in., round, perfect, white, not productive.

The weather continued dry for some time after planting the seeds, and the results given in the table are not to be taken as a conclusive test of the varieties.

Boston Pickling was the earliest variety. It is straight, smooth, and of good quality; excellent for pickling.

Long Green is a good variety for table use; medium early; vines vigorous and productive.

Parisian bears slender, long fruits, excellent for pickling.

Perfection has fruit of perfect form, smooth, and of good quality. The fruit remains in condition for table use a long time before ripening.

LETTUCE.

About forty varieties have been tested during the year, for forcing-house, hotbed, and out-of-door use.

TABLE VI.

Number.	Variety.	Seedsman.	Percent of germination in tester.	Percent of vegetation in soil.	Percent of vigor.	No. of days to vegetation.	No. of days to maturity.	No. of days to seed stalk started.	No. of days to bloom.	No. of days to seed ripen.
1	All Heart	J. & S.	89	63	40	6	87	110	143	166
2	All the Year Round	Hend	100	96	100	4	91	96	118	146
3	Arlington Tennis Ball	Gardiner	97	65	50	6	87	100	126	149
4	Boston Curled		67	62	50	6	91	95	109	143
5	Boston Market	Hend	97	96	90	5	87	89	113	155
6	Blonde Blockhead	Burpee	96	79	60	6	85	108	132	155
7	Bloomsdale Early Summer	Landreth	100	96	80	6	87	102	130	155
8	California Cream Butter	Burpee	99	95	80	5	91	100	132	155
9	California Cream Butter	Everitt	100	95	80	6	91	96	119	146
10	Chartier	Vaughan	91	88	20	6	91	109	131	155
11	Chicago Forcing	"	97	64	50	7	87	89	117	143
12	Early White Self-folding Cos	Ferry	94	63	40	6	91	108	138	163
13	Early Prize	"	97	56	50	6	87	104	132	155
14	Everlasting	Everitt	77	77	50	6	91	93	116	151
15	Forcing	Landreth	97	88	50	6	87	96	123	155
16	Grand Rapids	Livingston	95	57	40	6	87	100	127	155
17	Gold Nugget	Burpee	71	61	70	6	91	97	120	151
18	Green Fringed	Hend	100	93	75	5	91	100	130	163
19	Hanson	Burpee	96	82	90	6	87	104	134	156
21	Long Standing Bronze Head	J. & S.	96	33	30	6	91	108	134	155
22	M'k't Gard'n'r's Private St'k	Vaughan	100	94	70	5	87	97	127	155
23	Marblehead Mam'th Cabbage	Gregory	98	71	50	6	91	110	134	163
24	Marblehead Mammoth	Maule	97	73	75	6	91	109	134	159
25	New Cos or Celery	Hend	98	40	30	7	91	109	138	166
26	No. 21	Vaughan	100	97	90	6	91	106	131	155
27	Paris White	"	86	58	60	6	91	102	130	159
28	Philadelphia Butter	Ferry	96	81	85	6	91	92	119	146
29	Philadelphia Butter	Maule	98	84	80	7	91	99	114	141
30	Rudolph's Favorite	Vaughan	83	75	80	7	91	99	130	155
31	Salamander	Hend	100	73	75	6	91	99	128	155
34	Sugar Loaf	Gregory	100	67	50	6	91	102	131	155
35	Sunset	Hend	97	57	40	6	91	106	138	159
36	Yellow Seeded Butter	"	97	73	50	6	87	104	134	159
37	Philadelphia E'y Wh't Cab'g	Burpee	96	32	75	4	87	98	125	146

For forcing purposes the Grand Rapids is unequalled. It is one of the first kinds to mature, and on account of its upright habit can be planted closer than most varieties; for the same reason there is much less mildew and rot of the lower leaves.

Another strong point in its favor is the fact that the edges of the leaves never burn, and we have never seen a variety so free from rot of the inner leaves. The leaf has something the appearance of the Curled Simpson, and is very attractive in the market and on the table. We have sent some of our surplus lettuce to the hotels and stores in Lansing, and found it impossible to sell the Tennis Ball and similar varieties until the Grand Rapids was disposed of.

The Chicago Forcing from Vaughan is, next to Grand Rapids, our favorite variety for forcing purposes. The qualities commended in the

Grand Rapids are less strongly developed in this variety. With a little care in ventilating and watering, it will produce plants superior to the Grand Rapids, and a week earlier than Tennis Ball and similar varieties. The leaves are less upright in habit than the Grand Rapids, and differ in appearance by being rather more blistered and with edges more finely cut.

For hotbed purposes we find the Chicago Forcing superior to all others. It matured heads a week earlier than Grand Rapids, and they were much thicker and heavier.

The Arlington Tennis Ball (No. 3) is one of the best strains we have grown, and unless one of the above sorts is to be grown, will be found very desirable for forcing.

During the fall we wrote to several seedsmen and requested them to send us their two best forcing lettuces. In nearly every case White Tennis Ball was sent as one. We have generally grown the Boston Curled variety for forcing-house and hotbed purposes, but it is ten days later than Grand Rapids, and in several respects it is inferior to that variety.

Landreth's Forcing is a good variety, but all of the three first mentioned sorts are better. Market Gardeners' Private Stock and Boston Market are good strains of Tennis Ball, but the Arlington is better. Silver Ball from Hallock, is also a strain of Tennis Ball.

For hotbed varieties, in addition to the Chicago, Black-Seeded Simpson, Curled Simpson, Hanson, Blonde Blockhead (practically identical with Hanson), and Sugar Loaf will do well.

For the cold-frame and the open ground for spring use, the hotbed kinds did well, as did Chartier (Early Prize seems identical), which is an excellent variety with the wrinkled edges of its leaves tinged with red. All Heart would be a splendid lettuce were it not for its tendency to rot.

Of the summer varieties, All the Year Round, Everlasting, No. 21, and Salamander (all much alike), are excellent, as are Marblehead, Mammoth, and Sunset, which also seem identical.

The Cos varieties could not be distinguished.

PEAS.

The germinating power of the seed was determined in the seed tester, and on the 14th of May the seeds were sown in double rows, each containing as a rule 100 peas. The date and per cent. of vegetation were noted and will be found in the table.

The vines were supported on a woven wire trellis supported on stakes driven every ten feet.

We have used this for two years and find it particularly valuable for half dwarf sorts.

As soon as the pods were marketable, 50 were taken from each variety, weighed, shelled and the number and weight of the peas noted. As soon as the other pods were ripe they were picked and were used in determining the total yield of green peas. The yield was computed on the basis of 100 seeds planted.

TABLE VII.

Number.	Variety.	Seedsman.	Percent germination in tester.	Percent vegetat'n.	Days in vegetat'n.	Days to bloom.	Days to edible maturity.	Days to market maturity.	Days to first ripe pods.	Whole number stacks.	Whole number pods.	Average weight of a pod—oz.	Total weight of green pods—oz.	Total weight of green peas—oz.
1	Alaska	Root	80	31	10	36	44	47	56	29	39	.21	7.8	3.8
2	Am. Champion	Hend	90	31	10	43	76	81	88	23	69	.26	17.9	5.
3	Am. Wonder	"	92	35	9	36	47	48	59	31	75	.16	13.	6.8
4	Fleetwing	Greg.	92	30	9	36	45	48	54	15	40	.17	12.	7.
5	Extra Early	Bur.	78	35	12	32	44	47	55	26	90	.19	17.	9.
6	Abundance	"	95	25	12	47	69	76	88	18	137	.16	21.8	12.3
7	Morning Star	Hal.	95	63	12	36	44	47	56	50	109	.16	17.	8.5
8	Anticipation	N. B. G.	88	14	10	44	73	81	90	51	255	.18	4.5	2.
9	Crosby's Hyb.	Cros	94	83	10	41	55	61	65	51	168	.16	26.8	11.8
10	Dr. McLean	Hend	98	36	10	44	65	73	85	54	144	.24	34.5	16.5
11	Duchess	Gar.	90	34	12	41	83	85	92	52	17	.26	4.5	1.5
12	Earliest & Best	Sal.	97	74	10	36	44	47	59	51	150	.18	27.	15.
13	Lightning	Hal.	94	80	9	36	44	47	56	63	180	.18	32.	16.
14	Early Prize	Greg.	91	83	9	36	47	49	56	39	111	.23	25.5	10.
15	Extra Early	Lan.	63	36	12	36	44	47	56	31	105	.22	23.	13.5
16	Epicure	Hend.	74	49	12	33	47	54	59	44	76	.09	7.	3.8
17	Favorite	Greg.	90	59	12	37	68	71	87	49	235	.17	40.	21.
18	First of All	Hend.	68	48	12	36	44	47	56	37	128	.18	28.	11.5
19	First and Best	Ferry	62	34	12	36	44	47	57	27	109	.18	19.5	9.8
20	First in Market	Liv.	63	38	12	36	44	47	56	64	236	.20	47.	23.6
21	Hancock	Greg.	96	77	12	36	44	47	55	63	180	.19	34.	17.
22	Heroine	"	90	24	12	44	63	71	88	18	122	.26	31.8	13.5
23	Invicta	Hend.	87	51	12	36	49	55	64	49	123	.17	21.	12.
24	Evolution	Bur.	96	70	12	47	69	71	83	58	255	.24	61.	26.
25	John Bull	Hend.	94	47	12	44	66	71	83	31	154	.20	30.7	13.8
26	Marvel	Maule	86	64	12	44	62	66	71	63	388	.23	89.2	46.5
27	Philadelphia	Gar.	95	76	12	36	47	56	61	68	202	.15	30.3	20.
28	Pride of Mark't	Bur.	82	51	10	41	58	63	73	40	241	.20	48.1	21.5
29	Profusion	"	90	74	12	43	65	71	72	62	480	.24	110.4	43.4
30	Quality	"	91	39	12	37	54	58	76	35	225	.17	38.3	20.
31	Quantity	"	93	30	12	41	57	65	71	25	275	.20	55.	30.
32	Queen	Greg.	88	18	12	71	81	88	6	70	.14	10.	6.	
33	Rural New Y'k'r	Root	98	56	12	36	49	54	56	37	197	.18	35.4	21.6
34	Advancer	Hend.	79	26	12	36	48	54	64	15	148	.18	27.	14.8
35	Midsummer	"	80	62	12	41	64	68	72	59	350	.27	94.5	38.5
36	Minimum	Ferry	89	49	12	36	47	52	59	41	139	.17	28.5	10.
37	Marrow	Hend.	94	67	10	47	62	66	72	56	170	.22	37.3	17.5
38	St. D. Melting	Bur.	84	57	10	41	55	61	68	52	71	.23	16.2	7.
39	Summit	N. B. G.	56	37	12	36	44	47	54	20	160	.21	39.5	16.
40	Sati-faction	J. & S.	97	68	12	43	61	65	73	56	338	.24	61.	40.
41	Wm. Hurst	Gar.	88	4	12	37	49	52	59	5	.08	.5		3.
42	Everbearing	Bur.	86	43	12	44	68	72	85	35	341	.24	76.9	30.5
43	Fill Basket	Hend.	92	78	10	41	57	64	78	58	235	.21	49.	
44	Forty-Fold	Lan.	92	55	12	37	54	58	76	45	302	.13	39.3	21.
45	Hors'd's M'k't	Hend.	89	70	12	40	60	65	72	61	325	.23	74.8	42.3
46	Strategem	Bur.	96	46	12	43	71	76	83	28	193	.32	61.6	25.
47	Yorkshire	"	87	36	12	47	71	76	90	49	295	.28	82.6	31.5
48	R. N. Y. top p'ds	"	45	10	36	44	47	54	54	50	.21	10.5	5.5	
49	" top p'ds sel.	"	45	12	36	44	47	54	54	50	.21	10.5	5.	
50	" lower pods	"	51	12	32	44	47	54	54	50	.20	10.	5.	
51	" " sel.	"	43	12	36	44	47	57	57	50	.19	9.5	4.5	
52	Lax, E'l'st. top.	"	57	12	36	44	47	57	57	50	.19	9.5	4.5	
53	" top sel.	"	48	10	36	44	47	56	56	50	.20	10.	5.	
54	" l'w'r p'ds	"	27	12	36	44	47	56	56	50	.19	9.5	5.	
55	" " sel.	"	34	12	36	44	47	56	56	50	.21	10.5	4.5	
56	L'tle Gem, tp pd	"	1	12	37	54	56	57	57	59				
57	" t'p p'ds sel.	"	6	12	37	52	57	57	57					
58	" l'w'r " sel.	"	44	10	36	48	52	57	57					
59	" " " sel.	"	7	12	36	50	52	57	57					
60	Chelsea	Hend.	78	27	12	36	50	52	59	19	11	.04	.8	.5
61	Early May	Sal.	80	50	12	36	48	52	59	38	175	.17	29.8	14.
62	Marrowfat	Greg.	100	80	12	47	61	65	81	75	495	.22	108.9	49.2
63	Premier	Angell	100	78	10	36	47	49	59	69	88	.16	13.2	6.6

Of the twelve varieties ripening in 44 to 47 days from the date of planting there is little choice, and although some of them can be distinguished by slight differences of color or markings, most of them are near enough alike to be considered identical. The Summit and Fleetwing were low in vegetation, but have shown themselves to be valuable varieties. The First and Best, *Ferry*, and First in the Market, *Liv.* also made a good showing, as did Rural New Yorker, which ripened a few days later.

With differences so slight as existed between the sorts in this extra early class, more depends on the character of the strain than on the name of the variety under which it is obtained.

The Quantity and Advance were most productive among the second early sorts, while Quality, Profusion, Pride of the Market, Midsummer, Horsford's Market, and Satisfaction follow closely.

As the varieties in this group are more productive, and generally of better quality than those of the extra early sorts, it is only advisable to plant enough, of the early kinds, to bridge over the week or ten days before the Advancer and others of its class are ripe.

Among eighteen late kinds, the Everbearing was very productive, followed by Strategem, Abundance, Forty-fold, Yorkshire, and John Bull.

Nos. 48 to 59 in the table refer to an experiment to test the effect of planting seeds from the first pods to ripen (lower), as compared with those from the later pods (upper). We also tried to see if there was anything gained in size and weight of the pods by using seeds from selected, well-filled pods. Seeds of three varieties were used, and the time of ripening and the weight and number of pods can be found in the table. With two varieties there was no effect on the time of ripening, but the other indicates a slight gain by selection. The results are not definite as to the effect of selecting the large pods.

PEPPERS.

The peppers were sown in flats in the forcing-house on the 12th of March, pricked out April 4, and transplanted out doors June 4.

TABLE VIII.

Variety.	Seedsman.	Percent of germination in tester.	Percent of vegetation in soil.	Vigor—Scale, 1 to 10.	Number of days to vegetation.	Number of days to bloom.	Number of days to fruit ripening.
Cardinal.....	Ferry.....	76	45	9.	14	106	142
".....	Henderson.....	78	66	10.	13	92	148
Cayenne.....	Vaughan.....	12	11	5.	19	108	171
Celestial.....	".....	14	11	4.	21	106	*
Golden Dawn.....	".....	59	28	5.	22	118	155
Golden Upright.....	".....	77	46	7.	20	111	158
Large Bell.....	".....	86	46	8.	18	106	152
Procopp.....	Johnson & Stokes.....	56	45	9.5	15	112	152
Red Cluster.....	Vaughan.....	33	38	4.	13	105	171
Red Etna.....	Burpee.....	36	26	8.	18	108	157
Red Upright.....	Landreth.....	40	4	4.	19	111	*
Squash.....	Vaughan.....	81	71	10.	15	93	142
Ruby King.....	".....	61	31	8.	19	111	155

* Did not ripen before frost.

Cardinal, Procopp, and Red Etna have long, tapering fruits, bright red or scarlet; flesh thick and of mild flavor. Large Bell and Ruby King have large short fruits of dark red color; flesh thick and of mild flavor. Cayenne and Red Cluster have small tapering fruits of scarlet color; pungent flavor; productive. The Squash pepper much resembles a tomato in shape and color; productive and free from rot. Golden Dawn bears large fruits of a rich, dark yellow color and mild, sweet flavor.

Golden Upright differs from Golden Dawn by bearing fruits upright on stem; fruits large; plants more productive.

POTATOES.

The land used for the potato experiments had been used for corn and other farm crops, and did not receive either manure or fertilizer to fit it for the trial.

For the variety test, it was furrowed five inches deep, at intervals of 3 ft. 4 in. and these were divided into sections 33 ft. long, so each variety occupied one four-hundreth part of an acre.

Two pounds of seed of each variety were used, and cut into pieces of one ounce each. Thus, they were one foot apart in the row and the seedling was at the rate of $13\frac{1}{2}$ bushels per acre. The planting was done on the 22d of May, and although the weather was rather cold and wet for a number of days, all made a fair start and grew well for several weeks. Soon after the formation of tubers commenced, a severe drought set in, and growth was so checked that the crop was nearly a failure. Although the average yield was only about one fourth that of last year, they are relatively about the same, and the results are given in the table.

The actual yield is given in one column, and in the next the yield is reckoned on the basis of a full number of hills. Probably the average of these two would be a fair way of estimating the value of the variety.

TABLE IX.

Number.	Variety.	Seedsman.	Days to vegetation.	Per cent vegetation.	Per cent vigor.	Days to bloom.	Days to market maturity.	Yield per acre, bushels.	Corrected yield per acre.	Marketable.	Small.
1	Alaska	Alexander	13	97	75		** 91	100	109.9	62.2	47.7
2	Albino Early	Vaughan	13	94	85		** 89	140	140	93.3	46.7
3	Alligator	Rawson	14	100	70		** 91	70	72.1	10.3	61.8
4	Arizona	Vaughan	13	100	80		* 97	120	137.1	121.9	15.2
5	Badger State	"	15	100	70		* 89	46.6	46.6	39.9	6.7
6	Bannock	College	13	97	80		† 128	93.3	179.7	166.8	12.8
7	Beauty of Hebron	Jerrard	13	100	85		89	146.6	146.6	100	46.6
8	Belle of New Brunswick	"	15	100	80		** 78	106.6	106.6	73.3	33.3
9	Ben Harrison	M. Crawford	14	100	85		89	120	120	90	29.9
10	Bliss Seedling No. 1	"	15	100	60		97	40	53.3	13.3	40
11	" " " 2	"	16	100	40		97	36.6	38.9	21.2	17.7
12	" " " 3	"	17	64	60		97	26.6	43.8	32.9	10.9
13	" " " 4	"	15	100	70		89	43.3	49.4	22.8	26.6
14	" " " 5	"	15	95	60		89	46.6	50.1	7.1	42.8
15	" " " 6	"	15	100	60		89	53.3	84.9	31.8	53.1
16	" " " 7	"	16	100	60		78	36.6	39.	10.6	28.3
17	" " " 8	"	16	85	50		100	36.6	52.	28.3	23.7
18	" " " 9	"	12	91	70		100	56.6	60.2	28.3	31.9
19	" " " 10	"	13	75	25		97	5	9.1		9.1
20	" " " 11	"	17	70	15		97				
21	" " " 12	"	13	50	40		91	63.3	126.6		
22	" " " 13	"	16	63	5		128				
23	Boley's Northern Spy	Vaughan	15	100	75	52	89	93.3	99.5	64.7	24.8
24	Brownell's Best	Burpee	13	100	90		** 78	70	79.6	54	25.5
25	" " Winner	"	14	100	70		† 124	126.6	174.1	169.5	4.5
26	Burpee's Extra Early	"	13	100	80		* 86	133.3	142.1	106.5	35.6
27	Clark's No. 1	College	17	100	80		* 86	150	154.6	123.2	31.4
28	Copper Mine	"	15	100	80		* 100	173.3	173.3	170	3.3
29	Dakota Red	"	13	97	75		* 91	120	123.7	110	13.7
30	Dandy	Jerrard	14	100	90		* 89	133.3	133.3	106.7	26.6
31	Delaware	M. Crawford	13	100	90		89	133	141.8	110.4	31.4
32	Dictator	"	13	100	70		* 89	60	82.5	68.7	13.8
33	Early Harvest	"	12	100	60		† 91	116.6	124.1	81.5	42.5
34	" " Maine	Jerrard	13	100	85	50	89	160	160	133.3	26.7
35	" " Oxford	College	11	100	65		† 99	150	159.6	114.3	45.2
36	" " Puritan	Jerrard	14	100	85		** 78	133.3	133.3	126.7	6.6
37	" " Rose	"	15	100	85	50	89	166.6	166.6	150	16.6
38	" " Vermont	"	14	100	80		† 97	76.6	76.6	53.2	23.4
39	Empire State	"	15	100	85	55	† 128	180	180	160	20
40	Everitt	College	14	100	80		** 84	80	87.9	58.6	29.3
41	Excelsior	"	12	100	75		** 78	106.6	106.6	54.9	51.7
42	Extra, Early (Burpee)	Vaughan	13	100	70		91	123.2	123.2	106.5	16.6
43	Faust's 1889	College	16	100	75		91	106.6	146.6	114.5	32.1
44	Fee's Extra Early	Vaughan	15	100	80		89	93.3	93.3	66.6	26.6
45	Ft. Collins No. 83	College	16	97	80	52	* 86	146.6	146.6	109.9	36.6
46	Gardner's Early	"	11	97	60		† 91	81.6	84.1	37.7	46.3
47	Green Mountain	Vaughan	13	100	75		† 89	116.6	116.6	100	16.6
48	Gregory No. 1	College	12	100	60	59	91	116.6	124	102.7	21.2
49	" " 2	"	12	97	60		91	100	137.4	105.3	32.1
50	Harbinger	Jerrard	13	100	70		* 89	76.9	76.9	49.4	27.5
51	Howe's Premium	College	13	91	50		* 80	60	82.5	59.5	23
52	Ideal	Crawford	15	100	80		89	116.6	120.2	112.4	6.8
53	Imperator from Milan	"	15	75	70	67	97	153.3	180	47.2	132.7
54	June Eating	College	13	100	65	59	* 80	96.6	151.8	102	49.7
55	Leather Coat	"	13	97	90	50	** 78	146	146	109.5	36.5
56	Lee's Favorite	"	12	100	60		† 91	180	143	118	25
57	Matchless	"	13	100	75		* 97	96.6	102.8	49.6	53.2
58	Mexican Wild	"	13	100	75	52	† 128	96.6	96.6	80	16.6
59	Minister	Jerrard	13	70	75	50	* 78	100	100	66.6	33.3
60	Minister	Crawford	13	79	75	50	* 78	66	94.6	47.3	47.3

TABLE IX.—Continued.

Number.	Variety.	Seedsman.	Days to vegetation.	Per cent vegetation.	Per cent vigor.	Days to bloom.	Days to market maturity.	Yield per acre, bushels.	Corrected yield per acre.	Marketable.	Small.
61	Monroe's Seedling	College	13	100	80	---	** 84	90	99	51.2	47.8
62	Morning Star	"	13	100	80	---	* 80	130	130	100	30
63	Mrs. Cleveland	"	10	97	75	---	* 80	100	106.4	67.3	39.1
64	Mrs. Foraker	M. Crawford	12	100	90	---	* 84	126.6	126.6	93.2	33.4
65	Nameless No. 1	College	15	97	80	---	*108	118.3	122	111.7	10.3
66	" " 2	"	13	100	90	53	*100	170	175.3	144.3	31
67	New Queen	Jerrard	11	100	90	---	* 78	166.6	166.6	133.3	33
68	" "	College	13	100	75	52	91	128.3	128.3	103.8	24.4
69	Ohio Junior	Crawford	14	100	70	---	* 78	80.1	83.3	74.6	8.76
70	O. K. Mammoth	College	13	100	75	---	*100	120	127.7	102.8	24.8
71	Pecan	Crawford	13	100	80	53	* 89	33	45	30	15
72	Perfect Peachblow	"	17	100	75	---	* 70	54.9	57.7	23	34.7
73	Polaris	College	12	100	60	56	91	83.3	83.3	48.3	34.9
74	President Lincoln	"	14	100	80	---	* 97	130	142.9	122.5	20.4
79	Putnam's Beauty	"	13	84	70	54	* 97	56.6	89	73.3	16
80	" Early	"	10	97	60	---	91	130	158.8	120.1	38.6
81	" New Rose	"	16	100	80	52	* 80	130	130	103.8	26.1
82	" Select	"	17	91	75	---	* 99	90	106	86.3	19.6
83	Queen of the Valley	Jerrard	14	100	80	64	89	130	130	113.3	16.7
84	Randall's Beauty	College	12	91	70	---	* 80	53.3	73.2	50.2	23
85	Red Star	T. B. Main	13	97	75	60	* 97	106.6	140.7	136.3	4.3
86	Rochester Favorite	College	12	100	80	52	* 99	116.6	128.1	102.4	25.6
87	Rural Blush	"	14	100	80	---	* 78	124.4	128.2	101.2	27
88	Rural New Yorker	"	15	100	65	---	* 97	100	100	80	20
89	Solanum Jamesii	"	---	72	15	52	97	---	---	---	---
90	Stray Beauty	Jerrard	15	100	85	---	** 71	80	80	63.4	16.6
91	Summit	College	17	100	80	52	* 97	176.6	194.2	190.5	3.6
92	Superior	"	13	100	80	---	* 94	120	120	70	50
93	Sutton	"	13	100	75	67	*128	130	138.6	117.3	21.3
94	Timpe's No. 1	"	13	99	65	---	* 97	61.6	101.6	63.1	35.5
95	" " 2	"	13	100	75	---	* 99	113.3	113.3	73	40
96	" " 4	"	13	100	80	50	* 97	143.3	157.5	142.4	14.6
97	" " 5	"	13	94	75	---	* 97	73.3	100.7	73.2	27.5
98	" " 6	"	12	94	80	54	* 93	118.3	150.1	118.3	31.8
99	" " 8	"	14	100	80	---	**78	83.3	113.7	40.9	72.8
100	" " 9	"	13	100	90	---	**78	108.3	108.3	53.3	55
101	Thorburn	"	16	100	80	86	91	143.3	143.3	101.6	41.6
102	Wall's Orange	"	13	94	55	49	** 89	30	89.4	49.7	39.7
103	Watson's Seedling	"	15	94	85	54	* 97	116.6	120.2	82.4	37.7
104	West's No. 1	"	13	100	75	---	* 86	110	110	80	30
105	" " 2	"	13	97	70	64	* 97	66.6	115.6	69.3	46.2
106	" " 3	"	13	88	70	---	* 89	63.3	114.9	79	35.9
187	White Elephant	Jerrard	15	100	90	67	*122	220	220	193.4	26.6
108	White Star	"	14	100	90	---	* 97	116.6	116.6	93.2	23.4
109	Wixom's No. 29	VanBenschoten	13	93	50	---	89	73.3	73.3	26.5	46.8

* Ripened prematurely.

** Very prematurely.

†Made a second growth.

In last year's bulletin we described the seventy-five varieties grown, and we now append descriptions of the varieties new this year.

Albino—Plants of medium size; stalks slightly yellowish; tubers medium in size, somewhat pear-shaped, flattened, white; eyes shallow; flesh white. Early, quite productive, and of excellent quality.

Arizona—Plants rather stronger than Albino; tubers medium to large, oblong, slightly tapering from the stem end; color, light pink; skin slightly rough; eyes large, sunken; flesh white, season medium, quite productive.

Badger State—Plants stout, but of only medium size; tubers large,

long, slender, flattened, white, smooth; eyes surrounded by prominent ridges; flesh white. Rather unproductive.

Beauty of Hebron—Plants of medium size; tubers large, long, round or slightly flattened; skin smooth, light; eyes slightly sunken; flesh white. One of the most productive early varieties; quality very good.

Belle—Vines quite strong; stalks brownish green; leaves quite dark and much curled; tubers medium, oblong to round, rather irregular; skin, smooth, dark red; eyes shallow; flesh white, streaked with red. Fairly productive but of rather poor quality.

Ben Harrison—Stems of medium size, stout, light yellowish-green in color; tubers medium, round to oblong, slightly flattened, regular; skin white, smooth; eyes few, shallow; flesh white. A fairly productive, early variety of very good quality.

Boley's Northern Spy—Plants of medium size, stalks and leaves slightly yellowish. Tubers oblong and somewhat flattened, slightly irregular; skin smooth, rose color, reddish pink around the eyes; eyes rather deep; flesh white. Moderately productive. Quality good.

Brownell's Best—Plants above medium size, yellowish green stalks; tubers medium, oblong, flattened; skin smooth, white; eyes slightly sunken; flesh white. Rather more regular than Ben Harrison. Moderately productive; quality very good.

Brownell's Winner—Plants of medium size; stalks green; leaves small and dark green; tubers medium to large, oblong to long, flat, regular; skin light yellowish-pink, slightly rough; eyes shallow; flesh white. Quite productive and of good quality.

Burpee's Extra Early—Plants medium; stalks yellowish green; leaflets rather large; tubers of medium size, round to oblong and pear shaped; skin white, slightly rough; eyes rather few, slightly sunken; flesh yellowish-white. Quite productive for an early variety; quality good.

Dandy—Plants quite strong and vigorous; tubers long, round or slightly flattened; medium to large; skin white, slightly rough; eyes shallow; flesh white. Quite productive and of good quality.

Delaware—Plants of medium size and vigor; tubers medium, round to oblong; skin white, slightly rough; eyes shallow; flesh white. Season medium, quite productive; a promising variety.

Early Maine—Stalks of medium size, green; leaflets large; tubers of medium size, oblong, flattened; skin rose color, slightly rough; eyes shallow; flesh white. Greatly resembles Early Rose, of which it is a seedling. One of the very best of the medium early varieties.

Early Puritan—Plants vigorous, slightly above medium size; stalks yellowish; tubers large, color white; skin smooth; eyes somewhat sunken. Although very premature in ripening, it was one of the most productive early sorts. The tubers greatly resemble Beauty of Hebron.

Early Rose—Plants vigorous, size medium; stalks yellowish-green in color; tubers of medium size, oblong to long, round or slightly flattened, regular, rose color; eyes shallow; flesh white. This seed seems to be an excellent strain and proved quite productive. It was obtained from Jerrard of Caribou, Maine.

Empire State—Plants quite vigorous, strong, and spreading; tubers large, long or oblong, flattened, sometimes irregular or pear shaped, white, prominent ridges around eyes; flesh white; quality fair. One of the most productive of the late varieties.

Feek's Extra Early—Plants strong and above medium in size; tubers

small to medium, round, flattened; skin slightly rough, light; eyes few, shallow; flesh white. Rather unproductive, but apparently quite early.

Green Mountain—Growth of plant medium; tubers of fair size, oblong to rectangular, flattened; skin white; eyes few, slightly sunken; flesh yellowish-white.

Harbinger—Stalks of medium size and length; leaflets yellowish-green, quite large; tubers of medium size, round or oblong, regular and smooth; skin yellow. Yield rather low.

Ideal—Plants very strong and vigorous; tubers of good size, round to oblong, somewhat irregular; eyes shallow; skin rose color, smooth; flesh very white. Promises to be valuable on account of its quality, as it is fairly productive.

Imperator—Growth medium and very healthy; tubers medium, round to oblong, slightly flattened; skin white, smooth; eyes few and shallow; flesh very white. Rather unproductive, but of excellent quality.

Minister. Plants of medium size, yellowish-green, leaflets small. Tubers round to oblong, flattened; color white, blotched with pink; eyes sunken, flesh white. Early, but not productive.

Mrs. Foraker. Stems of medium length and quite small. Leaflets small, dark green, curled. Tubers medium, round to oblong, skin yellowish-white. Flesh white, eyes shallow, few. Quality very good; fairly productive.

Ohio Junior. Plants of medium size, stems greenish yellow; foliage tinged with yellow. Tubers of medium size; oblong, very irregular, skin rough at seed end; light pink. Eyes numerous, small and shallow, flesh white. Yield and quality fair to good.

Pecan. Stalks of medium length; yellowish. Tubers medium; pear-shaped; skin white, slightly roughened; eyes few, very shallow; flesh white. Yield very poor.

Perfect Peach-blond. Stems and leaves of medium size and yellowish-green. Tubers of medium size; round to oblong, slightly flattened; eyes shallow, pink. Flesh and skin white. Quite unproductive.

Queen of the Valley. Plants of medium size. Leaflets rather small, dark green. Tubers large, oblong; light pink, smooth; eyes shallow, skin white. Of fair productiveness and quality.

Red Star. Stalks and leaves of medium size, dark green. Tubers large, oblong, flat; large prominences around eyes; skin smooth, reddish-pink; flesh yellowish-white, rather coarse; quality fair. Quite productive.

Stray Beauty. Plants small and much injured by blight. Tubers small, nearly round; pink; eyes numerous, sunken. Flesh yellowish. Lacking in productiveness owing in part to blight, to which it is very subject.

Vermont. Plants above medium in size; stalks and leaflets yellowish-green. Tubers of medium size, round to oblong, regular and smooth, yellowish-pink. Eyes shallow, numerous; flesh, yellowish-white. Rather unproductive even for this season. Quality fair.

White Elephant. Plants large and strong; leaflets medium to large in size, and very healthy. Tubers large, long, round, slightly flattened; skin yellowish-white, a little rough but regular; eyes slightly sunken; flesh whitish-yellow; the most productive variety grown. Quality fair.

Owing to the premature drying up of the vines, from blight and drought, we are not able to judge accurately of the actual earliness of the varieties. Last season, Premium and Gardner's Early ripened first, followed by Early

Harvest. These are all of good quality, but not very productive. Ripening within a week of these sorts are Timpe's No. 4, which this year produced 157 bushels; Early Rose, 150 bushels; Early Ohio, New Queen, 133 bushels; Early Maine, 133 bushels; Early Puritan, 126 bushels; Putnam's Early, 120 bushels; Timpe's No. 6, 113 bushels. Of the varieties yielding over 100 bushels and ripening about August 1, are Clark's No. 1, Burpee's Extra Early, Dandy, Delaware, Hebron, Early Oxford, Faust's 1889, Ft. Collins No. 83, Gregory No. 2, Ideal, Lee's Favorite, New Queen, Queen of the Valley, Thorburn, Gregory No. 1, Morning Star, June Eating, and Putnam's New Rose. All but six of these varieties were grown last year, and as confirming the accuracy of the test, it may be noted that every one of the above old sorts was in the selected list of last year, and that the lowest yield of any of them was about 300 bushels. It may be stated that the crop this year averages from 35 to 40 per cent. of what it was in 1889.

There is but slight difference in the quality of these sorts, all being good to very good, except, perhaps, Lee's Favorite, which is rather coarse, and sometimes watery.

Of the late sorts, White Elephant and Summit were most productive, with Copper Mine, Brownell's Winner, Bannock, Empire State, and Nameless No. 2 not far behind. Red Star, Arizona, President Lincoln, and Dakota Red were also productive. None of these varieties are of high quality, and although valuable market sorts, some others, better in quality, might be selected for home use.

The Wild Mexican variety has been grown here for a number of years, and has greatly increased in size and yield. The eyes are rather deep, and it is too coarse to be a valuable variety.

The *Solanum Jamesii* has shown itself much less susceptible to improvement, and we have been able to detect no increase in the size, which is about three fourths of an inch in diameter.

CHANGE OF SEED.

When potatoes are grown under favorable conditions they can hardly be said to run out, and yet we have found it desirable to occasionally obtain fresh seed.

In the spring of 1890, we obtained from various parties seed potatoes of some of the old standard sorts and of several new kinds.

The New Queen was the only variety duplicated from our old stock, and when the crop was dug this fall we found a gain of over 30 per cent in favor of the northern grown seed. Our seed of New Queen was selected from a crop that yielded over 300 bushels per acre. We were not able to make any strict comparison of the other varieties, but we had growing alongside of them other varieties that are usually fully as productive, but this year the new seed seemed to make by far the best showing. We believe it will pay every farmer to obtain fresh seed once in three years. If one has a choice strain that he wishes to retain, it could be done by placing it in the hands of some reliable party with a different soil, or better yet in a neighboring state, and after two years receiving it back.

Last year we tried a number of methods of planting, fertilizing, and cultivating potatoes, and as a check on the results, the experiments were repeated on a larger scale, and generally with three varieties, so that triplicate results were secured for comparison. As a rule, the results do not differ materially from those of last year, except as they were affected by the early drought.

IS IT ECONOMY TO THROW AWAY THE SEED END OF POTATOES?

To test this question we selected 25 tubers of each of three varieties, and cutting them transversely into three equal portions, we had pieces from the middle and from the seed and stem ends, of the same potatoes.

This year a similar test was made, and below will be found a summary of the results obtained, the results for 1889 also being given.

TABLE X.—*The Use of the Seed End of Potatoes.*

	Superior.				Timpe's No. 6.				Seedling A.			
	Yield per acre, bushels.	Corrected.	Market.	Small.	Yield per acre, bushels.	Corrected.	Market.	Small.	Yield per acre, bushels.	Corrected.	Market.	Small.
Stem.....	153.3	153.3	90	63.3	150	154.6	123.2	31.4	133.3	133.3	96.7	36.6
Middle.....	156.7	172.4	132	40.4	166.6	177.3	149	28.3	143.3	147.7	96.1	51.6
Seed.....	175	175	136.7	38.3	163.3	168.4	134.1	34.3	130	134	89.3	44.7
	Average bushels seed per acre.				Average market yield per acre.				Net Gain.			
Stem.....	23.53				103.3				79.77			
Middle.....	27.91				125.7				97.5			
Seed.....	20.55				120				99.45			

Average of the results obtained in 1889.

	Bushels seed used per acre.	Market yield per acre, bushels.	Net Gain.
Average stem end.....	15.1	274.47	259.37
Average middle.....	20.3	294.80	274.50
Seed end.....	17.2	278.12	260.92

It will be seen that in both years the middle seed pieces have given best results, but it has happened that, in both trials, these have been slightly heavier than the seed end pieces, and the average yield above seed shows little difference between the seed and middle portions. The stem end gave in both years a smaller yield than either of the others.

One reason given for cutting off the seed end, is that the crop raised from that end would contain a large proportion of small tubers, but our trials show, for both years, a smaller yield of unmerchantable tubers from the seed end than from either of the other portions.

The test has now been conducted for two years, with five different varieties and under various conditions, but with results that seem to us conclusive that a given weight of the seed end is as valuable as an equal weight from the middle of the tuber. The average yield from the stem end, however, is considerably less than from either of the other portions, the difference being greater than the amount required for seed. This indicates that when cutting to small pieces, it is well not to use the stem end as, the eyes being weak and poorly developed, the crop will be lessened. Never use the stem end of a potato for seed unless the piece is large enough to include one or more strong eyes from the middle of the tuber. By cutting seed lengthwise this is secured.

HOW FAR APART IN THE ROW SHOULD POTATOES BE PLANTED?

There is a great diversity of opinion and practice on this point, and to obtain some light upon it, eyes, quarters, and whole tubers were planted at intervals of from one to three feet. The test was made a duplicate one by use of two varieties. The number of hills of each variety ranged from 25 to 50, according to the distance between the hills.

In preparing our seed, we came across two boxes of potatoes on which the names of the varieties could not be made out. As they were very even, they were used for this experiment. They proved to be very unproductive kinds, especially No. 1. The seed used averaged as follows: Single eyes, $\frac{1}{2}$ oz.; quarters, 1 oz.; halves, 2 oz., and whole tubers, 4 oz. in weight.

TABLE XI.—Results of Planting at Different Distances.

		Seedling No. 1.				Seedling No. 2.			
		Yield per acre.	Corrected yield.	Market size.	Small.	Yield per acre.	Corrected yield.	Market size.	Small.
1 foot apart...	{ Single eyes	19.8	41.2	34.4	6.8	70.4	80	53.8	26.2
	{ Quarters	30.8	38.5	27.5	11	70.4	90	56.6	33.4
	{ Halves	55	63.1	17.9	46	103.4	112.2	62.6	49.6
	{ Wholes	74.8	79.5	30.3	49.2	149.6	167.2	78.5	88.7
1 $\frac{1}{4}$ feet apart—eyes		35.2	44	32.4	11.6	46.2	58.2	45.8	12.4
1 $\frac{1}{2}$ feet apart...	{ Single eyes	28.6	32.5	20	12.5	52.8	55	42.9	12.1
	{ Quarters	35.2	36.3	18.1	18.1	63.8	63.8	44	19.8
	{ Halves	39.6	44.8	22.4	22.4	88	88	57.2	30.8
1 $\frac{3}{4}$ feet apart—single eyes		21	25.5	20.4	5.1	46.2	56.2	42.7	13.5
2 feet apart...	{ Single eyes	14.2	17.7	10.1	7.6	46.2	52.5	42.5	10
	{ Quarters	24.2	24.2	13.2	11	47.3	47.3	36.3	11
	{ Halves	31.9	39.8	24.7	15.1	72.6	72.6	50.6	22
	{ Wholes	59.4	63.1	27.8	35.3	96.8	101.2	59.8	41.4
2 $\frac{1}{2}$ feet apart...	{ Quarters	25.3	26.8	17.5	9.3	28.7	31.2	22	9.2
	{ Halves	18.7	20.2	11.8	9.4	55.9	60.4	41.4	19
3 feet apart—wholes		40.6	44.7	27.8	16.9	89.1	89.1	64.9	24.2

Summary Giving Average Yield.

	Distances Apart in Rows—feet.													
	Market Potatoes.							Total Crop.						
	1.	1 $\frac{1}{4}$.	1 $\frac{1}{2}$.	1 $\frac{3}{4}$.	2.	2 $\frac{1}{2}$.	3.	1.	1 $\frac{1}{4}$.	1 $\frac{1}{2}$.	1 $\frac{3}{4}$.	2.	2 $\frac{1}{2}$.	3.
Single eyes	44.1	39.1	31.5	31.5	25	—	—	60.5	56.1	43.8	40.9	35.1	—	—
Quarters	42	—	31	—	24.7	19.7	—	64.3	—	50	—	35.8	59	—
Halves	40.2	—	39.8	—	37.7	26.6	—	88	—	66.4	—	56.2	30.8	—
Wholes	54.2	—	—	—	43.8	—	46.3	123.4	—	—	—	82.2	—	66.9

The drought and the consequent check to the growth have affected the results to some extent, but we believe some general conclusions can be drawn from them.

It will be noted that, as the size of the seed was increased, there was a resulting increase of the yield, both in the total and market crops, and that this occurred at the various distances, except in the case of the market yields at one foot, where there is a slight apparent exception. Attention may also be called to the fact that the yield from small seed rapidly decreases as the distance between the hills increases.

A careful study of this table leads to this opinion: Single eyes and quarters of medium-size potatoes, may be placed in drills from a foot to fifteen inches apart; when halves are used the distance may be increased to two feet, and when whole tubers of medium size are planted they may be placed at from two and one half to three feet, and thus admit of cultivation both ways. In each case these are intended as maximum distances. This will require from 12 to 15 or perhaps 20 bushels of seed potatoes per acre. With well prepared and thoroughly drained soil, *and in favorable seasons* the smaller amount might be somewhat diminished with profit, but for the average planter, and in average seasons, the largest would prove best in the long run.

In 1889, we made two series of experiments intended to show something regarding the amount of seed to use, and the method of cutting it. This year the experiments were repeated, using three varieties in each.

In one of them 66 potatoes of each variety were selected, weighing about twenty pounds.

Half of them were planted whole, one foot apart, the others were cut in two parts, lengthwise, and a half of each planted. The remaining halves were again divided and a piece (quarter) of each planted. This was kept up until we had halves, quarters, eighths, and single eyes from the same tubers, thus doing away with any personal equation that might exist in the tubers. The following table gives the results obtained with each variety, together with the average of the three.

TABLE XII.—*Results Obtained from Different Amounts of Seed.*

	Row 17, Clark's No. 1.				Row 18, Burbank.				Row 19, Seedling A.			
	Yield per acre, bushels.	Corrected yield.	Market.	Small.	Yield per acre, bushels.	Corrected yield.	Market.	Small.	Yield per acre, bushels.	Corrected.	Market.	Small.
Whole potatoes containing:												
Row 17, 467 eyes, weighing 10 lbs....	183.3	183.3	103.7	79.6	155	155	86.6	68.4	146.6	146.6	66.6	80
“ 18, 576 “ “ 8½ lbs....												
“ 19, 504 “ “ 11½ lbs....												
Half potatoes containing:												
Row 17, 247 eyes, weighing 4½ lbs. }	150	150	90.7	53.3	135	135	66.6	68.4	120	136.5	98.7	37.8
“ 18, 288 “ “ 4½ lbs. }												
“ 19, 273 “ “ 5½ lbs. }												
Quarters containing:												
Row 17, 122 eyes weighing 29-16 lbs. }	123.3	135.6	95.2	40.4	121.6	133.7	69.6	64.1	160	160	114.4	46.5
“ 18, 133 “ “ 2½ lbs. }												
“ 19, 117 “ “ 2 15-16 lbs. }												
Eighths containing:												
Row 17, 57 eyes weighing 15-16 lbs. }	106.6	110.1	96.4	13.7	70	72.1	41.5	20.6	156.6	156.6	119.9	36.7
“ 18, 72 “ “ 11-16 lbs. }												
“ 19, 72 “ “ 15-16 lbs. }												
Single eyes:												
Row 17, 33 eyes weighing 10 oz. }	73.3	78	63.9	14.1	93.3	96.2	89.4	68.7	93.3	93.3	66.6	26.7
“ 18, 33 “ “ 8½ oz. }												
“ 19, 33 “ “ 14 oz. }												
Size of Seed.									Average bushels of seed per acre.	Average market yield per acre, bushels.	Net gain, bushels.	
Wholes.....									66.6	85.6	19.6	
Halves.....									31.3	87.3	56.	
Quarters.....									16.9	93	76.1	
Eighths.....									8.19	85.9	77.7	
Eyes.....									4.5	73.3	68.8	

The results show that the total yield gradually decreases as the amount of seed is lessened. The quantity of small tubers decreases even faster, however, so that the yield from the halves and quarters is larger than from the whole tubers or single eye. The quantity of seed used in whole tubers is sixteen times as great as with single eyes, and, after deducting the seed used, the net results are in favor of eighths (8 bushels of seed) and quarters (16 bushels per acre).

With a favorable season the halves and whole tubers would have developed a larger per cent. of their small tubers, and the results would have appeared much more favorable to them. At the beginning of the drought the plants from the large tubers were nearly twice as large as those from the single eyes. With this excess of leaf surface and small tubers, the effect of the dry weather was very marked and the vines died down (prematurely) several days before those from the small pieces of seed.

Last year the potatoes used for seed averaged somewhat smaller than those for this year's trial, and the halves at the rate of 20 bushels per acre made the best showing. Under favorable conditions we think that this amount of seed will be most profitable for the ordinary grower.

The other experiment referred to, in addition to indicating the proper amount of seed per acre, was designed to throw light on the questions:

1. Is the half of a large potato better than a small potato, the weight of the half being equal to that of the whole tuber?

2. Can tubers just below the merchantable size be profitably used for seed purposes?

The results are given below, and although there is a slight variation noticeable, we think a careful comparison of the performance of the three varieties under the different conditions can be profitably made.

TABLE XIII.—*Halves Compared with Whole Tubers of the Same Weight.*

	Burbank's.				Seedling A.				Clark's No. 1.			
	Yield per acre, bushels.	Corrected yield.	Market.	Small.	Yield per acre, bushels.	Corrected yield.	Market.	Small.	Yield per acre, bushels.	Corrected.	Market.	Small.
Whole potatoes weighing 8 oz.	206.6	206.6	116.6	90	166.6	166.6	49.9	116.7	163.3	163.3	53.3	109.9
Halves each weighing 4 oz.	170	170	82.5	87.5	153.3	153.3	83.4	69.7	136.6	136.6	66.6	70
Whole potatoes weighing 4 oz.	156.6	156.6	76.7	79.9	150	150	60	90	150	150	93.3	56.7
Halves weighing 2 oz.	150	150	93.4	56.6	143.3	147.9	89.4	58.5	173.3	173.3	106.7	66.6
Whole potatoes weighing 2 oz.	146.6	151.2	91.6	59.6	-----	-----	-----	-----	150	154.6	96.19	58.41
Halves weighing 1 oz.	103.3	109.9	85	24	-----	-----	-----	-----	146.6	154.2	108.7	47.5
Whole potatoes weighing 1 oz.	96.6	96.6	55.3	41.3	-----	-----	-----	-----	150	159.6	96.6	63
Halves weighing ½ oz.	60	63.8	35.4	28.4	-----	-----	-----	-----	150	154.7	123.7	31

Size of Seed.	Bushels seed per acre.	Average market yield per acre.	Net Gain.
Wholes weighing 8 oz.	110	73.3	Loss, 36.7
Halves each weighing 4 oz.	55	77.5	22.5
Wholes weighing 4 oz.	55	76.9	21.9
Halves each weighing 2 oz.	27.5	96.4	68.9
Wholes weighing 2 oz.	27.5	93.89	66.39
Halves each weighing 1 oz.	13.7	98.6	84.9
Wholes weighing 1 oz.	13.7	75.9	62.2
Halves weighing ½ oz.	6.8	79.5	72.7

So far as the amount of seed is concerned, the figures substantiate those of the last season and the experiment reported above, the largest market yields being obtained with the use of from 13 to 27 bushels of seed per acre, with the largest net yield when 13.7 bushels were used.

It also appears that halves are better than whole tubers of the same weight, and a natural conclusion from this is that a whole small potato is not as good as the half of a potato twice as large. As a matter of economy, it is a question whether it is best to feed these potatoes of about the size of a hen's egg to stock, and plant only large merchantable tubers, or to plant the small potatoes.

In case one must purchase seed potatoes at a high price, it might yield as large net returns to plant small ones, if they are of good varieties, but in this case the practice should not be kept up year after year.

It is well to obtain fresh seed for planting as often as once in two years, since experiments have shown that, in potatoes as in other vegetables, a frequent change of "seed" is desirable.

DEPTH OF PLANTING.

Three varieties of potato were planted at depths varying from one to five inches. The average results seem to favor shallow covering, the largest yield being obtained at one inch; the showing at two inches being next best.

TABLE XIV.—*Depth of Planting.*

Depth of planting, inches.	Thorburn.				Sutton.				Clark's No. 1.				Average market yield of three varieties, bushels.
	Yield per acre, bushels.	Corrected.	Market.	Small.	Yield per acre, bushels.	Corrected.	Market.	Small.	Yield per acre, bushels.	Corrected.	Market.	Small.	
5	111.1	120.7	71.7	49.	154.	157.1	112.8	44.3	94.6	94.6	50.6	44.	78.36
4	174.4	181.8	89.5	92.3	115.5	125.5	90.9	34.6	96.8	98.7	35.5	63.2	71.96
3	112.2	112.2	63.8	48.4	137.5	149.	105.7	43.3	123.2	131.	76.	55.	81.88
2	129.8	131.6	87.	44.6	150.5	194.5	153.	41.5	124.3	124.3	61.2	63.1	100.40
1	174.4	174.4	111.9	62.4	140.8	184.4	155.6	28.8	138.6	174.4	94.1	80.3	120.53

FERTILIZERS.

To test the use of fertilizers and manures for potatoes, four varieties were treated in sixteen different ways. The manure was applied at the rate of thirty two-horse loads per acre; the fertilizers as indicated in the table ranging from 900 to 1,400 pounds per acre, and wood ashes at the rate of 67 bushels. The varieties were seedlings, which we desired to test, and proved worthless. The crop was a very uneven one, and only general conclusions can be drawn from the results. By comparing the yield from the nothing plots, with the plots on either side treated with manure or fertilizers, it will be noticed that a gain of from 25 to 50 per cent. was obtained from their use. There seemed to be little difference whether the fertilizers were applied above or below the seed. Although the fertilizers gave slightly better results than stable manure, it can be attributed in part to the nature of the season. The slight excess in yield will not warrant the use of fertilizers at commercial rates where manure can be obtained, as it can in most portions of the state, practically for the hauling. Wood ashes can, as a rule, be easily obtained, and for potatoes or any other crop can be used with profit. In addition to the plots mentioned above, four others were used, in which sulphate of potash was tested against unfertilized plots, but little or no difference was noticeable.

TABLE XVI.—*Fertilizers.*

Plots contain four rows, each 50 feet long.

- PLOT I.—Covered with strawy manure as a mulch between rows.
 II.—Nothing.
 III.—Four lbs. sulphate ammonia, 10 lbs. ground bone, 6 lbs. muriate potash, under the seed and forked in.
 IV.—Same fertilizers as above, except that they are above the seed.
 V.—Furrow half filled with rotten manure before planting.
 VI.—Nothing.
 VII.—Six lbs. sulphate potash, 10 lbs. ground bone, 4 lbs. sulphate ammonia, forked in under the seed.
 VIII.—Same as above, but sown on top of seed.
 IX.—Wood ashes, one bushel.
 X.—Nothing.
 XI.—Six lbs. nitrate soda, 10 lbs. ground bone, 6 lbs. sulphate potash, under seed.
 XII.—Same as above, but above the seed.
 XIII.—Seed covered one inch and furrow filled with coarse manure.
 XIV.—Nothing.
 XV.—Ten lbs. ground bone, 6 lbs sulphate potash, under seed.
 XVI.—Same as above, but over the seed.

Plots.	Seedling No. 3.	Seedling No. 1.	Pringle's No. 6.	Seedling No. 2.	Everett.	Rural Blush.	Dictator.	Thorburn.	Average market yield per acre.	
I.....	82.5	81.2	39.6	44.3	-----	-----	-----	-----	46.9	Mulch.
II.....	47.1	30.2	24	31.1	-----	-----	-----	-----	33.1	Nothing.
III.....	182	36.2	58.1	114.9	-----	-----	-----	-----	97.8	Fertilizer under seed.
IV.....	143.7	-----	-----	-----	-----	-----	115	93.5	-----	Fertilizer over seed.
V.....	98	52.8	49.4	92.8	-----	-----	-----	-----	78.2	Manure.
VI.....	71.4	19.6	29.3	80.8	-----	-----	-----	-----	50.2	Nothing.
VII.....	71	39.9	83	115.4	-----	-----	-----	-----	77.3	Fertilizer under seed.
VIII.....	113.5	-----	-----	-----	56.3	103.4	132.9	-----	-----	Fertilizer over seed.
IX.....	126.1	58.1	35.6	87.3	-----	-----	-----	-----	75.5	Wood ashes.
X.....	100.3	27.4	30.5	96.3	-----	-----	-----	-----	68.6	Nothing.
XI.....	83.8	37.5	80.5	-----	-----	-----	255	-----	-----	Fertilizer under seed.
XII.....	90.8	-----	-----	-----	61.6	137.2	102.1	-----	-----	Fertilizer over seed.
XIII.....	124.1	80.2	63.1	112.2	-----	-----	-----	-----	94.9	Mulch.
XIV.....	110	43	58.6	85.3	-----	-----	-----	-----	74.2	Nothing.
XV.....	161.6	62.8	83.6	-----	-----	-----	128.4	-----	-----	Fertilizer under seed.
XVI.....	122	-----	-----	-----	62.9	139.1	-----	-----	-----	Fertilizer over seed.

RADISHES.

Forty-three varieties of radish were sown May 7, in rows ten feet long with two and one half feet space between rows. After vegetation, the radishes were thinned to two or three inches apart. Plaster mixed with a small quantity of London Purple was used with good effect in preventing the ravages of the Flea beetle.

TABLE XVII.

	Variety.	Seedsman.	Percent of germination in tester.	Percent of vegetation in soil.	Number of days to vegetation.	Percent of vigor.	Number of days to seed-stalk started.	Number of days to bloom.	Remarks.
1	Cardinal Globe	Dreer	94	68	13	60	46	49	Tops small, root red, round.
2	Chartier	Burpee	96	81	12	65	45	52	Tops large, root long, red, lighter toward top.
3	Red Ball	"	48	19	14	20	52	58	Tops small, root red, round.
4	Scarlet Short-top	Ferry	94	73	11	70	49	62	Tops medium, root scarlet, long.
5	Round Red	Hend.	100	81	11	80	46	50	Tops small, root red, round.
6	Scarlet	Maule	95	88	11	75	45	50	Tops small, root red, white tipped, round.
7	Scarlet Globe	Salzer	94	54	13	60	45	51	Tops small, root red, round.
8	Scarlet Turnip	Ferry	98	84	11	90	44	48	Tops small, root red, round.
9	"	Hend.	100	86	10	80	46	49	Tops medium, root scarlet, oblong.
10	Scarlet Olive	Vaughan	91	63	12	60	46	50	Tops medium, root scarlet, olive shaped.
11	White Turnip	Hend.	100	91	12	75	45	50	Tops small, root white, round.
12	Eldorado	"	98	86	12	70	48	55	Tops small, root yellow, round.
13	French Breakfast	"	92	47	13	60	49	54	Tops small, root red, oblong, white tipped.
14	"	Ferry	100	29	13	50	54	66	Tops small, root red, white tipped, oblong.
15	Giant Stuttgart	Maule	96	66	12	80	45	51	Tops large, root white, long.
16	Chartier	Ferry	99	88	12	85	40	46	Tops large, root long, red, lighter toward tips.
17	Fire-ball	Dreer	96	91	11	70	46	49	Tops small, root red, round.
18	Scarlet Short-top	Hend.	100	86	12	85	44	51	Tops medium, root scarlet, long.
19	White Perfection	Everitt	97	88	11	90	46	52	Tops large, root white, long.
20	Gardener's Scarlet	Landreth	100	85	11	90	45	54	Tops medium, root long, scarlet.
21	Winter	Maule	100	89	10	95	41	47	Tops large, root white, long.
22	Celestial	Hend.	100	97	10	95	44	47	Tops rather large, root white, long.
23	Newcom	Everitt	100	97	12	100	39	50	Tops large, root white, long, olive shaped.
24	Golden Globe	Burpee	100	97	12	75	39	45	Tops small, root yellow, olive shaped.
25	Nonpareil	Vaughan	100	81	12	80	39	44	Tops small, root scarlet, round.
26	Ne Plus Ultra	Ferry	100	77	12	75	41	47	Tops small, root scarlet, round.
27	Scarlet Olive	Hend.	98	91	10	95	39	45	Tops medium, root scarlet, olive shaped.
28	Philadelphia Box	Maule	100	64	13	70	41	47	Tops small, root white, round.
29	Forcing	Hend.	98	25	16	20	54	62	Tops small, root red, white tipped, round.
30	Forcing Turnip	"	100	67	13	60	42	47	Tops small, root red, round.
31	Rocket	"	100	85	12	65	44	49	Tops small, root red, round.
32	Rosy Gem	Root	99	90	12	65	52	62	Tops small, root red, white tipped, round.
33	Surprise	Vaughan	100	97	13	65	47	50	Tops small, root yellow, olive shaped.
34	1834	Maule	99	89	12	95	42	47	Tops rather large, root white, long, olive shaped.
35	Twenty-day	Salzer	81	42	13	50	43	51	Tops small, root red, white tipped, round.
36	Violet Turnip	Hend.	98	84	12	90	45	49	Tops small, root violet, round.

TABLE XVII.—*Continued.*

	Variety.	Seedsman.	Percent of germination in tester.	Percent of vegetation in soil.	Number of days to vegetation.	Percent of vigor.	Number of days to seed-stalk started.	Number of days to bloom.	Remarks.
37	White Chinese.....	Burpee	100	85	11	95	43	47	{ Tops large, root white, long, olive shaped.
38	White Olive.....	Hend.	86	55	13	80	47	52	{ Tops small, root white, olive shaped.
39	Strasburg	Burpee	100	87	11	95	47	54	{ Tops large, root white, long, olive shaped.
40	Scarlet Ball.....	"	94	75	13	50	45	53	{ Tops medium, root scarlet, white tipped, round.
41	Scarlet Turnip.....	Hend.	93	78	13	70	43	51	{ Tops small, root red, white tipped, round.
42	Wood Frame.....	"	99	92	11	95	46	54	{ Tops small, root long, scarlet.
43	White Globe	Burpee	53	17	15	60	45	57	{ Tops medium, root white round.

The following sorts are recommended for the purpose named.

Forcing radishes—Cardinal Globe, French Breakfast, Forcing Non-pariel, White Turnip, Eldorado.

Summer radishes—Wood Frame, Scarlet Short-top, Chartier, Celestial, Strasburg.

SQUASHES.

The squashes were planted on the 11th of June, in hills eight feet apart each way.

TABLE XVIII.

Variety.	Seedsman.	Per cent of vegetation in soil.	Number of days to vegetation.	Number of days to bloom.	Number of days to edible maturity.
Chicago Marrow.....	Vaughan	56	3	45	78
Ford Hook.....	Vaughan.....	76	5	55	89
Illinois Beauty.....	Vaughan.....	40	4	52	93
Illinois Beauty.....	Gregory.....	53	5	52	93
Cocozelle Bush.....	Burpee	69	3	54	-----
Gem.....	Vaughan.....	46	4	57	89
Strickler.....	Gregory.....	41	4	40	68
Summer Crookneck.....	Vaughan.....	45	3	41	68
Vegetable Marrow.....	Vaughan.....	48	3	45	83
Warren.....	Gregory.....	33	4	58	99
Pineapple.....	Vaughan.....	48	4	60	99

Chicago Marrow. Much the shape of Hubbard; diameter, seven to nine inches; dark orange-yellow color; flesh firm; valuable for earliness and good keeping qualities.

Ford Hook. Six to nine inches long; diameter at center, four to five and one-half inches, tapering to base and apex, ridged; rich yellow color; flesh same. A good variety for home use; too small for market.

Illinois Beauty. Ends are deep green, center yellow, ridged; flesh yellow, firm; seed cavity small; eight to ten inches long; three to four inches at base, tapering. Prolific, but many of the squashes are too small for use.

Cocozelle Bush. Grows in close bush form; vines vigorous, hardy; fruit 16 to 18 inches long; diameter, two inches at base, enlarging to five to six inches at apex; round, slightly ridged; dark-green with lighter streaks. Edible when small.

Gem. Small; good for summer or winter use.

Strickler; Summer Crookneck. Excellent for early use.

Vegetable Marrow. Fruit 10 to 12 inches long; diameter, six to seven inches; nearly round; yellowish-white in color; productive. Not much grown in this country. Excellent if used before it becomes hard.

Warren. 12 to 14 inches in diameter; 10 to 12 inches long; dark orange-yellow; shell hard, thick. At the apex is an irregular, white projection, which detracts from the appearance of the squash. A good keeper. Probably a cross between Essex Hybrid and Turban.

Pineapple. Attractive on account of peculiar shape and creamy-white color; a fall variety; productive.

TOMATOES.

The experimental planting of tomatoes included about 100 varieties. The seeds were sown in boxes in the forcing-house on the 13th of March. The seedlings were pricked out in thumb pots on the 9th of April, repotted into three-inch on the 7th of May, and transplanted to the open ground on the 14th of June. Twelve plants of each variety were used in the test, each having a space five feet nine inches by four feet. The plants were supported by a wire trellis made of six-inch fence boards driven into the ground every eight feet, and with two lines of No. 12 galvanized wire on each side, one and two feet from the ground. This furnished a space six inches wide in which the plants could be trained.

Fifteen varieties were used in an experiment to learn the effect of selecting the seeds of the first ripe fruits, on the earliness of the resulting crop, half of the plants being grown from early selected seeds and the others from the main crop. This is the third year that this experiment has been tried.

In the following table will be found the results of the test. The notes were taken on the twelve plants grown, but the number and weight of fruits were obtained from two plants of each variety, selected as showing an average condition.

Under the columns headed "September 10," are the number and weight of the fruits obtained from the two plants up to that date; this is designed to show the value of the different sorts as early varieties.

TABLE XIX.

Variety.	Seedsman.	Per cent germination.	Per cent vegetation.	Per cent vigor.	Days to vegetation.	Days to bloom.	Days to first ripe fruit.	Number ripe fruits, Sept. 10.	Weight, ounces, Sept. 10.	Total number fruits.	Total weight fruits, ounces.	Average weight ripe fruit.
1 Tom Thumb	Rawson	100	86	90	10	96	158	78	180	404	667.	2.30
4 Precursor	Nellis	93	85	65	10	98	151	33	152	338	954.	4.14
4a Hundred Day	Thorburn	98	80	70	11	100	148	37	161	302	760.	4.
6		88	88	70	10	76	146	119	236.5	456	853.5	2.06
6a		100	81	100	11	92	140	137	268.5	453	788.	2.06
11 Large Red	Dickson	97	56	60	9	99	146	51	225.	324	959.	4.08
11a	"	100	88	100	11	99	146	70	150.	373	894.	3.23
12 Early Dwarf Red	"	100	83	75	9	77	160	62	176.	568	950.	2.92
17 Keys' Prolific	Neuman	94	83	60	10	95	135	83	212.5	297	704.5	2.96
17a		79	75	85	11	77	131	102	258.	395	882.5	2.46
18 Turkenband	"	91	82	70	10	98	170	23	41.	502	550.5	1.72
19 Boston Market	Rawson	100	56	70	10	99	146	59	134.5	249	601.5	2.66
19a		92	78	90	11	100	146	54	140.	284	607.	3.02
27 Cook's Favorite	Gregory	100	60	75	9	100	149	57	142.	315	870.	3.6
27a		97	44	68	11	99	146	57	116.5	298	532.	2.33
29 New York Market	Nellis	100	30	50	10	93	148	27	98.5	296	756.5	4.11
29a		98	85	90	7	77	146	54	153.	387	900.	3.2
32 Victor	Neuman	100	79	75	9	77	146	113	376.5	290	974.	3.5
32a		95	87	90	10	77	146	67	292.5	191	619.	3.45
35 Extra Selected Trophy	Henderson	93	72	90	10	93	160	4	90.5	223	713.5	2.38
42 Queen	Nellis	100	92	95	10	93	155	2	6.	191	857.	7.5
52 Favorite	Sibley	100	73	75	9	98	146	44	174.	212	776.5	4.47
52a		64	26	65	11	77	148	47	116.5	208	708.	3.
59 Hathaway	Root	100	71	85	8	95	146	41	161.	284	820.5	3.88
59a		97	83	100	10	93	145	58	232.	313	829.5	3.77
67 Advance	Burpee	100	75	80	10	77	142	103	184.5	295	558.5	1.78
67a		100	78	95	10	77	135	119	239.5	324	519.5	1.62
71 Paragon	Henderson	100	76	85	11	93	146	22	75.5	246	690.	4.03
74 Autocrat	Sibley	100	92	80	10	95	151	11	60.5	200	857.	5.29
74a		100	18	70	-----	77	155	48	292.	212	781.	4.43

75	Mayflower	100	78	85	11	77	146	63	129	301	589	2.22
79	Scoville's Hybrid	100	73	90	11	95	163	8	37	269	802.5	4.62
82	Extra Early or Cluster	100	72	75	8	88	137	60	281	181	604	3.91
82 a	"	98	48	95	11	93	187	56	224	176	615.5	3.87
85	Peach	100	98	100	10	93	148	49	80.5	556	654.5	1.6
96	Jackson's Favorite	94	78	90	8	93	146	38	179	206	807	5.08
96 a	"	98	85	100	10	97	148	67	116.5	254	604.5	2.09
103	Acme	100	83	85	11	93	156	19	96	857	1,080	5.3
107	Beauty	99	83	100	11	100	158	10	62.5	312	1,141.5	3.12
108	Climax	100	74	80	10	96	142	42	120	847	659.5	1.82
100 a	"	97	49	95	11	95	137	28	100.5	304	826	3.48
114	Ophime	100	68	100	10	97	158	34	155	199	706.5	4.78
118	Vick's Criterion	95	78	100	10	93	142	80	82.5	553	1,251.5	2.77
121	Golden Queen	100	88	100	10	96	151	85	199	755	4.82	4.82
126	Yellow Victor	100	84	100	10	99	151	76	831	195	742.5	4.01
128	Jaune grosse lisse	97	78	95	9	100	166	4	32	162	787	8.45
131	New White Apple	99	100	95	10	93	158	57	87	581	669	1.56
131	Green Grape	97	94	95	9	78	130	7	---	---	---	70
139	Red Cherry	83	72	85	8	93	116	---	---	---	---	.29
141	Yellow Cherry	98	100	70	10	98	116	---	---	---	---	.15
148	Poire	99	70	60	10	93	135	---	---	---	---	.43
153	Yellow Pinn	100	87	70	9	93	123	---	---	---	---	.46
154	Eiffonige Dauer	96	61	75	10	100	146	143	160.5	---	---	1.14
154 1/2	Ignomin	100	73	95	8	96	148	19	126	199	924	6.06
154 1/2 a	"	100	73	95	9	93	147	23	146.5	196	959.5	6.52
161	Potato Leaf	99	84	90	10	95	153	12	26.5	253	933	4.54
166	Current	100	80	85	8	68	116	---	---	---	---	.40
168	Sunset	100	100	95	11	98	131	8	45	389	1,699	6.8
170	Puritan	100	79	100	10	93	153	9	57	227	963	6.51
171	Americus	100	66	95	9	79	166	7	52	181	578	7.94
172	Dwarf Champion	97	63	80	10	98	144	40	165.5	207	686.5	4.35
173	Glen Cove	99	91	90	9	93	155	16	86	179	783.5	5.42
178	Jersey	99	91	75	10	100	153	40	214	153	691	5.21
179	Golden Queen	98	75	75	9	97	146	17	115.5	241	501	6.43
182	Freude	98	79	80	10	79	137	76	142	447	710	1.83
188	King	99	75	75	9	93	137	86	346	364	856.5	3.8
188	Harvard	97	48	80	10	79	153	28	159	201	738	5.71
187	Matchless	95	71	80	9	99	151	14	75	175	659.5	5.37
187	Mikado	100	77	80	8	98	166	12	94	157	914.5	8.2
188	Earliest	99	95	75	8	93	121	233	691	318	888.5	2.92
189	No. 8	100	77	85	8	99	155	53	247	230	756	1.67
190	Belle	100	79	85	9	93	153	12	74	277	889	5.76
191	Red Apple	97	82	85	9	93	158	57	236	386	845	4.15
192	Red Mikado	98	80	85	8	104	166	45	280	159	934.5	6.24
194	Glan	96	88	85	9	100	176	21	144	220	1,116.5	5.64
195	Turner	100	75	85	8	106	179	3	30	226	1,387	11.67

TABLE XIX.—Continued.

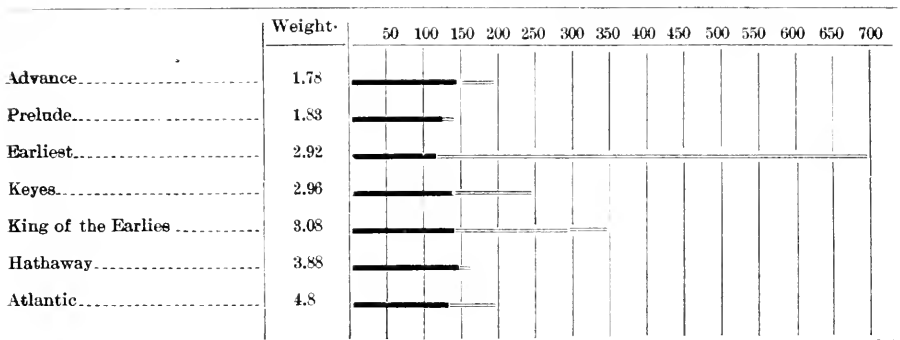
	Variety.	Seedsman.	Per cent germination.	Per cent vegetation.	Per cent vigor.	Days to vegetation.	Days to bloom.	Days to first ripe fruit.	Number ripe fruits, Sept. 10.	Weight, ounces, Sept. 10.	Total number fruits.	Total weight fruits, ounces.	Average weight ripe fruit.
196	Volunteer	Dreer	100	88	55	6	99	162	32	164.	181	701.5	4.99
197	Nichol's Stone	Nichols & Shedd	92	66	55	9	98	162	3	54.	197	881.5	8.68
198	Perfection	Livingston	100	70	90	9	93	158	56	271.	198	712.	4.64
199	Haines	N. B. & G. Co.	99	75	90	9	96	150	53	365.	208	988.5	4.88
200	Bay State	A. B. Howard	97	93	95	9	95	155	6	28.	164	527.	5.75
201	Atlantic	Johnson & Stokes	100	93	100	9	93	130	48	240.5	150	688.	4.8
202	Brandywine	"	79	58	80	9	99	155	39	222.5	170	720.5	6.17
203	Cumberland Red	"	97	72	80	8	95	158	55	268.	257	931.5	4.86
204	Ruby (Early)?	Henderson	100	42	75	9	95	162	46	275.5	219	854.5	6.04
205	LaCrosse	Salzer	82	56	70	9	100	152	49	264.	190	798.	5.36
206	Morning Star	"	78	33	65	10	100	166	26	247.5	170	850.5	8.13
207	Dwarf Champion	Maule	95	56	70	11	99	151	19	97.	172	614.5	5.14
208	Perfect Gem	Salzer	91	56	70	11	93	151	47	229.	165	613.	5.02
209	Red Cross	Gregory	99	27	65	11	99	151	37	192.5	255	1,051.5	5.55
210	Earliest of All	Salzer	96	85	90	9	102	148	63	283.	216	831.	4.52
211	Station	Burpee	79	18	60	11	133	175	6	8.5	76	167.5	2.9
212	Table Queen	Henderson	100	30	65	6	100	148	42	228.5	178	786.5	5.53
213	Tree	Maule	87	29	50	11	139	193			42	145.	5.67

As in 1889 the first fruits were obtained from the Earliest (Vaughan), which was six days ahead of Prelude, the next variety to ripen. The fruits of the Earliest are more than one half heavier than those of Prelude, and the plants are nearly five times as productive (up to Sept. 10.) The Atlantic Prize ripened nine days after the Earliest and was the largest distinctly early tomato grown this year, the average weight, up to Sept. 10, of the ripe fruits, being five ounces.

In a graphic form below we show first, on the scale at the left, the average weight of the fruits of all the valuable varieties that ripened in 137 days or less; 2d, by the dark lines, the number of days to maturing fruit; 3d, the total weight of fruit produced before Sept. 10, shown by the light lines.

The second scale shows, by the black lines, the average weight of the more productive varieties, and the total weight of fruits by the light lines; in the latter case each space representing 100 units.

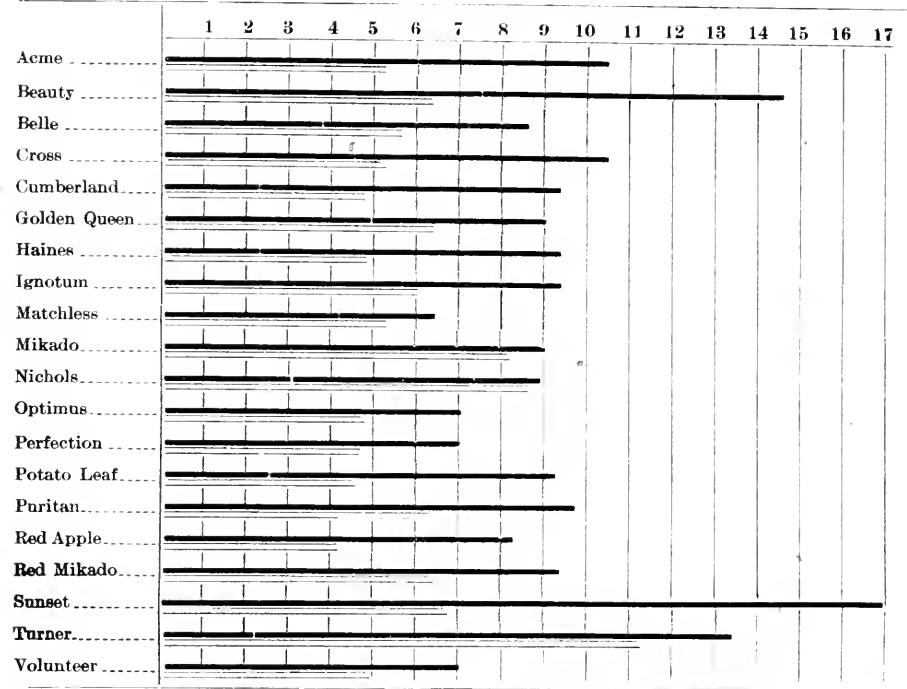
TABLE XX—*Earliness and Yield of Early Sorts.*



———— Earliness, in days.

===== Yield, weight of crop from two plants in ounces.

TABLE XXI—Yield and Average Weight of Twenty Best Sorts.



———— Yield, each line representing 100 ounces received from two plants.

==== Average size of the fruit, each line representing an ounce.

Of the second-early varieties Haine's King of the Earlies and Victor (Canada) were most productive. Advance and Hathaway will also give satisfaction.

The Victor was obtained four years ago from Germany, and by careful selection the form has been much improved.

Of the red varieties for the main crop, the Ignoutum, Cumberland Red, Red Cross, Puritan, and Red Mikado were most productive. Perfection, Optimus, Nichols, Volunteer, Red Apple, Belle, and Matchless, are all valuable. The Mikado (Turner), Beauty, Acme, and Potato Leaf were best of the purple varieties, and Sunset and Golden Queen of the yellow sorts.

All but nine of the varieties on our list have been grown by us more than one year, and descriptions have been given in Bulletins 31, 49, and 57. We therefore append only descriptions of the new sorts, and of such of the old kinds as are of especial merit.

Acme, (103). One of the best of the old varieties for home use. The fruits are purplish pink in color. Medium to large in size, regular and smooth, and inclined to crack in the cavity, owing in part to its thin, tender skin. Plants strong, leaflets quite large.

Advance (67). Plants slender. Leaves narrow. One of the earliest of the smooth varieties. Fruits always smooth, spherical, of medium size. Formerly very desirable on account of its earliness, but its place has now been largely taken by the Earliest (Vaughan).

Atlantic, (201). Plant of medium size. Foliage yellowish-green. Leaflets narrow. Fruit of medium size, round, slightly flattened, somewhat ribbed and angled, cell walls rather thin. The earliest medium-size tomato grown.

Beauty, (107). In plant and color of fruit much like *Acme*. Fruits larger, more solid, and a better market variety. Very productive, and of a good quality. One of the best of the pink sorts.

Belle, (190). A good variety of the Cardinal class. Fruits of good size, slightly flattened, light red. Walls rather thick. Quite productive.

Cross, (red) (209). A very productive new variety. Plants quite strong, foliage light green, leaflets rather small. Fruits smooth, round, slightly flattened, rather dark red. A well selected variety of the Perfection type.

Cumberland, (red) (203). Resembling the last, except having foliage and fruits of a lighter color, and somewhat smaller.

Earliest, (Vaughan) (188). Plants short and slender, spreading; leaflets small, light yellowish-green, and few in number. Fruit medium in size, flat, slightly ribbed, light red. The earliest variety grown. Cell walls rather thin, but standing up well for shipping.

Golden Queen, (198). Plants strong, leaflets rather small and dark green. Fruits medium to large, regular, round, slightly flattened, smooth, bright yellow. Cell walls rather thick. A good yellow variety.

Haines, (No. 64). (199). Plants large and strong; leaflets rather long and dark green. Fruit of medium size, smooth, nearly spherical, light red. Cell walls rather thin, weight light.

Ignoutum, (154½). Another year's selection has served to so fix the type of this variety, that few rogues will be found. It has now been thoroughly tested in all parts of the country, and almost without exception it is pronounced as the best tomato for home use, for market, or for canning. Some complaint was received of its rotting, but we found it no more

subject to rot than other large, smooth, red varieties. Where the plants received frequent and regular cultivation, and were not checked in their growth, little or no rot was observed.

The Matchless is much like the Ignotum in plant and fruit, but with us the plants are less productive, and the fruits are smaller.

King (of the Earlies) (183). Plants rather small, spreading; fruits in clusters, rather small, flat, slightly angled; cell walls rather thin. Next to Vaughan's Earliest, the most productive early variety.

Matchless (186). Plants of medium size, stout; fruits solid and quite regular, round, slightly flattened. Something like Ignotum, but less valuable.

Mikado (Turner 195) (187). Leaves and habit of the *grandifolium* style, very strong and healthy; fruits large, flattened, somewhat irregular, oblong with stem in deep cavity. Some of the fruits have a large core. Color pinkish-purple; cells thin walled.

The Turner strain gives fruits averaging somewhat larger than Mikado, and the yield is somewhat larger.

Nichols (197). Much like Paragon, very solid, generally regular. A good late variety.

Optimus. A medium-size variety of the Perfection style, nearly spherical, smooth, and of excellent quality. One of the best for home use.

Perfection, (198). One of the best medium-size, smooth varieties. Less productive than the Paragon and its strains, and not firm enough to be a good market sort, but its quality makes it desirable for home use and local market.

Potato Leaf, (161). A well selected strain resembling Mikado in foliage. Fruits of medium size, generally quite smooth, round and flattened. Hardly firm enough to be a good shipping variety, but valuable for home use and local market.

Puritan, (170). A large and desirable variety of the Paragon class. Not quite so early as Ignotum, and the fruits are less solid than those of that sort, but in size and number they approach it very nearly.

Red Apple, (191). In plant and general appearance of fruit hardly appreciably different from Optimus and Perfection. The fruits are rather more inclined to grow in clusters, and it is a rather better market variety.

Red Mikado, (191). A rather late red strain of Mikado, rather more regular and with thicker cell walls.

The following notes of other varieties, nearly all of which are new, are appended. In some cases our tests had proved unsatisfactory and new seed was procured for another trial.

Brandywine, J. & S., (202). A medium variety in time of ripening. Plant vigorous, leaflets dark green, and rather long. Fruit smooth, or with small angles at the cavity, round and flattened, of good size, but with rather thin cell walls.

Dwarf Champion, Maule, (270). This variety has, with three years' trial, failed to satisfy any of the claims made for it. Other varieties are two to three weeks earlier, and the plants are much less productive than other kinds. Although the growth is short and stout it is far from being self-supporting, as it was claimed to be. It is, however, a fair variety, as, owing to its dwarf habit, it can be planted closely.

Earliest of all, Salzer, (210). This does not seem appreciably

different from King (of the earlies) *Ely*, and is certainly no better than well selected strains of that variety.

La Crosse, Salzer, (205). The twelve plants of this variety grew in the same row with Dwarf Champion from Maule, and within a few feet of the same variety from Henderson, and we were unable to detect any difference between them. It is, however, a well selected strain.

Morning Star, Salzer, (206). The only difference between this variety and Mikado that was noticeable was that the fruits were more regular in form. We can only recommend it as a well selected strain of that variety.

Perfect Gem, Salzer, (208). In every respect identical with Red Apple from Ferry, (181).

Ruby, (Early) Hend. 204. In making out our record books the name for No. 204 was not put down, and as our notes are kept with numbers for the varieties, the defect was not noticed until too late to have it corrected with *absolute* certainty. Our books show that we received the Ruby, and as it is the only new variety unaccounted for, it is supposed that the plants grown as No. 204 are of that variety.

Our notes however are quite unlike the description given by Henderson, who claims it to be earlier than Perfection and Dwarf Champion. With us it is slightly later than those sorts, of medium size, round, flattened, with slight angles at the cavity, fairly productive, firm, and of good quality.

Station, Burpee (211). We have grown this variety from seeds direct from the N. Y. station at Geneva, but it has lacked the early qualities claimed for it by others. With a new strain of seed we have had no better success. Rather late, lacks productiveness, fruits small, regular.

Sunset (168). Much like Golden Queen in fruit, although the plants are unlike. One or two fruits ripened two weeks ahead of any on the Golden Queen plants, but the crop was if anything later. Fruits of large size, quite heavy and with thick cell walls; bright yellow in color, with rather more red than is shown by Golden Queen.

Victor (Canada) (31). Considerably improved from the *old* Canada Victor, of medium size, slightly angular, and quite productive. Valuable as a second early sort.

Volunteer (196). A rather flat form of the Paragon. Cells with walls less thick than those of that variety. Size medium, smooth and regular.

Table Queen, Hend (212). The fruits of this variety resemble in shape and general appearance a pink Trophy, and although a moderately smooth, firm, and solid sort, we can see nothing to make it worthy of the extravagant claims made for it. It is of medium size, and only moderately productive.

Tree, Maule, (213). Another trial of this sort only confirms our former impression of the lack of any value in this variety even for home use.

This year's test of new varieties shows that some of the seedsmen are practicing what would be considered in larger matters a state prison offense. A large portion of the new varieties are only old ones renamed, and as they are brought out with extravagant representations, and at a price from two to four times as great as is charged for the same thing under its proper name, it looks as if a clear case of obtaining money under false pretenses could be made out of it.

The wide-awake, enterprising market gardener is eager to obtain the new and valuable varieties, but if the present practice of some of the seedsmen is persisted in, it will certainly lead to the injury of all, as, rather than

trust to the chances of obtaining a valuable novelty, the gardeners will depend on such kinds as have been well tested and are known to be valuable.

EFFECT OF USING SEEDS FROM THE FIRST RIPE FRUITS.

For three years we have attempted to learn the effects of planting seeds from the first fruits that ripened, as compared with those selected late in the season.

The first two years, a slight gain in the earliness of the crop was noticed, but it was observed that while this gain was considerable in the case of varieties of the angular type, it became a loss when the smooth, apple-shaped sorts were considered.

This year, the results show, as an average of fifteen varieties, that the plants grown from early selected seeds gave ripe fruits in 143 4-5 days, while those from the main crop were 145 2-15 days, a difference of $1\frac{1}{2}$ days in favor of early selected seeds. As in previous years, the angular sorts show a marked difference, while in the apple-shaped sorts there is, if anything, a slight average loss in earliness.

Taking the number of ripe fruits up to September 10, we find an average gain of four fruits to the plant by early selection.

The greater portion of the work of planting, cultivating, and growing the crops treated of, has been done by the members of the junior class of the College, who are assigned to this department for three hours each day throughout the college year, for practical instruction in horticulture.

They have thus become familiar with the methods of vegetable culture, and have also had an excellent opportunity of studying the characteristics, and learning the merits, of the different varieties. In this work they have been under the direct charge of my assistants, thus securing accuracy and rendering the work far more instructive.

During the first portion of the year I was assisted by Mr. H. P. Gladden and Mr. D. Anderson. In August Mr. Anderson resigned, and Mr. H. J. Hall was appointed to succeed him. The notes have been largely taken and the tables have been compiled by them. Mr. Gladden has also furnished the accompanying notes on beans, beets, cucumbers, peppers, radishes, and squashes.

L. R. TAFT,
Horticulturist.

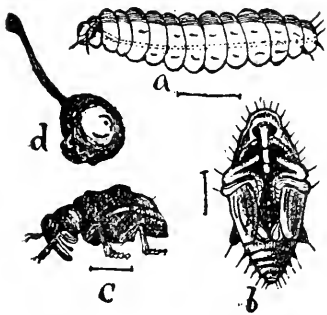
AGRICULTURAL COLLEGE, MICH., }
January 1, 1891. }

FIGHTING THE PLUM CURCULIO.

By A. J. Cook, Bulletin No. 66, Zoölogical Department.

The Entomologist of the station is very glad to receive specimens of insects, and will always answer inquiries regarding the same. Insects should be sent by mail in close strong boxes—tin or wood. Paste-board boxes are not strong enough, and are often crushed. Insects sent in letters are almost always crushed beyond identification unless inclosed in quills or capsules. The postage will not be more than one or two cents. A little cotton with the insect will prevent jarring and breakage. In case larvæ, caterpillars, grubs, etc., are sent, some of their food-plants should take the place of the cotton. This prevents shaking and supplies food. No holes should be made to supply air. Any information regarding the insects sent, will be gratefully received, and may prove very valuable. Where found; damage done; and any other facts.—A. J. COOK.

This paper was read in substance before the Association for the Promotion of Agricultural Science, at the Indianapolis meeting, August 19, 1890, and at the request of many fruitgrowers is sent out as a bulletin.



a larva; b pupa; c imago; d stung plum.

The natural history of the Plum Curculio (Fig.) is well known. The little weevil is hardly more than two tenths of an inch long. It is rough, with elevated longitudinal lines, two of which, on the middle of the back, one on each side, are very prominent. The color is brown, dotted or lined with white and beaded with black. The two large humps are black, and rest on a black quadrangular spot. The beak is about the length of the head and prothorax and is bent under and back. The legs are brown, specked and ringed with white. The femur or main joint of the legs is much thickened. The curculio commences to visit the trees late in May in Central Michigan, or at just the time the little dried up circle—the calix—is falling from the young fruit. By jarring the trees I have shown repeatedly that the curculio does not visit them at an earlier date. The insect now commences to feed on the leaves, on the fruit, and the female to lay her eggs. These latter (Fig.) are always laid within a crescent, cut by the curculio, in the fruit. At the base of a little puncture within this crescent, the egg is easily found. The insects continue to lay eggs till the first of July, by which time the beetles from the first laid eggs begin to come forth. So that there is no time in the year when the beetles may not be found. During June, at time of egg-laying, the beetles often spend the day, especially early in June, when the weather is cold, concealed under clods or chips, beneath the tree. Towards night-fall they seek the fruit and may walk up the trunk of the tree, or may fly from the ground to the tree. I have seen them going both ways.

During this egg-laying season the beetles feed on both fruit and foliage. It is generally true that imagos, or mature insects that are several days or weeks laying their eggs, take no little food. We see the curculio is no exception. The eggs are probably developing all through this feeding season.

Whenever the weevil, or the limb on which it rests is jarred, the curculio draws up its legs and falls from the tree. This habit would of course be very valuable to the insect, as it would save it from hungry birds. It is very easy to see how through the law of natural selection this habit might have been formed.

As the eggs hatch, the footless grubs (Fig. *a*) pierce to the center of the fruit—plum, apricot, peach, cherry, apple, or pear,—where they feed and grow for about three weeks, when they leave the fruit, enter the earth to pupate (Fig. *b*). In a few days—about a week—the mature beetles come forth, and await the following spring, which will furnish in the fruit of plums, cherries, peaches and apples a nidus for its eggs. Generally the curculio do very little harm after July 1. I think they never lay eggs to any extent after that date. They may, and certainly do at times, pierce the plums or apples even after this date, causing the former to rot, and the latter to become dwarfed and misshapen.

THE CURCULIO A FRIEND.

It would seem a novel idea that the curculio is, or may be, the friend of the orchardist. It doubtless prefers the plum to any other fruit, and so if the pomologist will plant liberally of this luscious fruit close among his other fruits, he will rarely be troubled with an attack by this insect upon any other fruit, except it be tender, thin-skinned varieties of peach, like the Hale's Early and Alexander, and apricots, and there is evidence to show that even these fruits will be little disturbed if plum trees are hard by, and abundant. As the fruit of the apple tree is so stunted and deformed as to become nearly or quite worthless if seriously attacked by the curculio, and as cherries are utterly worthless if attacked, it is more than probable that in time it may pay excellently well to plant plums to protect other fruits, especially as our wild fruits become more and more cleared away. If we *can* grow one of our most luscious fruits, and at the same time protect others from damage or destruction, the fact and the method are well worth our attention.

I am aware that Prof. F. M. Webster claims to have proved by his observation that the curculio shows no such preference as the above. In an orchard with apple and plum trees well mixed, both kinds of fruit were attacked. I believe his observation was for one year. Possibly the insects had not been destroyed on previous years and so were so abundant that all fruit was attacked. Many years' observation makes me very positive in the opinion as stated above. Wide inquiry among our best Michigan fruit men confirms me in my belief.

Again, the plum tree is very likely to over bear, injuring the tree, and lessening the value of the fruit. In such cases it is necessary to the best success that the fruit be thinned. There is no help at the command of the fruit grower that will do this so cheaply as will the curculio. He will work for nothing, and take his board from the waste fruit. Some of our most extensive and successful plum growers, in view of this fact, count the

curculio an excellent friend, and say they would be very loath to part with his services.

Once more, the fact that the curculio is ever on hand, always to be counted on, makes it necessary to forego the luxury of plums, or to fight the curculio. But most orchardists, either through ignorance or neglect, will not fight the insects, so the fruit will be scarce, and the price high. Thus our best plum-growers say that the curculio advances the price of plums far in excess of the expense of so fighting him as to secure a crop of finest fruit.

If then, by growing plums abundantly, we may have our cherries, apples, etc., and by aid of the curculio may thin our plum crop to the advantage of both tree and fruit, and can also receive a far higher price in the market for our plums—much more than enough to pay the expense of fighting the insect—then surely we need not make wry faces, exclusively at least, as we contemplate the character and work of the plum curculio.

FIGHTING THE INSECT.

As the curculio comes forth in spring, it must be some distance from the fruit that is likely to become victim to its ravages. Through some sense, probably smell, it is attracted to the fruit. Hence the remedy suggested and practiced by Mr. J. N. STEARNS of Kalamazoo, Michigan, to mix one pint of strong crude carbolic acid with fifty pounds of newly slaked lime, and throw this into the trees in the early morning while the dew is still on. The theory is that the strong odor will disguise the trees so the curculio will not find them, or else is so repugnant to the weevils that they will give them the go-by.

Two years ago I tried this remedy with seeming success. One year ago, and this year, I tried it most thoroughly, and with no success at all. Trees heavily powdered, before the curculio commenced their attack, had in a week not a single unstung plum, though there had been no rain in the interim. The trees were small, so though they were in full bearing the plums were not very numerous. I consider these tests crucial. While I would not say that this treatment might not sometimes do good, and possibly save a crop, I do say emphatically that it is not reliable, and can not be depended on to save our plums. I am sure that I applied this material more thoroughly than most growers would do.

SPRAYING WITH THE ARSENITES.

After proving, ten years ago, that spraying with London purple and Paris green was a most satisfactory remedy against the codlin moth, I commenced at once to test the virtues of the same application for the curculio. I never even seemed to meet with any success till 1888, when I thought we received signal benefit from our spraying with the arsenites. As we have proved, by putting curculio in bottles with sprayed leaves, that they may be and are poisoned by such treatment, I was hopeful, almost persuaded, that my previous experiments had not been sufficiently thorough; that the smooth skin of the plum would not hold the poison as would the apple, and even a passing shower would or might remove it.

Thus, last year and this, I determined to test the matter most thoroughly. Trees were very thoroughly sprayed, at intervals of ten days, as many as five times, and after each rain, and yet in several cases every

plum was stung and fell off. Some small trees, heavily loaded, were sprayed, and though no rain came to remove the poison, yet in less than a week all the plums were stung by the curculio. Both last year and this, with the exception of one tree, nearly all the plums were stung. These fell from the tree, were all gathered up and cut open, that we might be sure that the grubs were present. As before, while I would not say that spraying will do no good, I feel certain that it will never prove satisfactory. We must have a remedy that we can rely on to protect our crop. I know positively, by positive experience, that spraying is not one. Occasionally we secure a crop, with no effort to fight the curculio. Does not this suggest an explanation why some who have given this remedy a limited trial speak so highly of it? I think our practical plum-growers generally agree with me in the above conclusions. It is true, however, that curculio may be thus poisoned. The past season we shook fourteen curculio from an unsprayed tree and divided them into equal lots. One lot was put into a bottle with leaves sprayed the previous day, the others into a bottle with leaves unsprayed. Three days later all were well. Another tree was then thoroughly sprayed and the leaves given to the same lot that had received the sprayed or poisoned leaves before. The others were fed fresh, unsprayed leaves. On Monday, the second day after, all in the bottle with the sprayed leaves were dead, while all the others were well and lively. Thus they are, or may be, poisoned, but in actual practice they either escape, or else the effect is so tardy that the mischief is done before the poison takes effect.

Dr. C. M. WEEB of the Ohio experiment station, sprayed on a large scale in an orchard in northern Ohio the past season, and seems to have met with surprising success. From my own experiments I can only ask, would the crop have been a failure had he not sprayed? And if so, will he get equal results every season? In my case the evidence is positive. It certainly proves that he who relies on spraying will often be sadly disappointed. I wish it were otherwise.

In case of peaches, spraying is so likely to injure the foliage that even were it a certain specific against the curculio its use would be hardly to be recommended. If soluble arsenic be present, and time is given for solution to occur, even though we may make the mixture very dilute, and add lime, the leaves will sometimes all fall off. We can never know in practice that even Paris green is not adulterated with soluble arsenic. We used London purple, one pound, to two hundred gallons of Bordeaux mixture, and not only removed all the leaves but actually killed the twigs.

THE RANSOM CHIP TRAP.

I have already referred to the habit of the insect, especially early in the season, of coming down from the tree, perhaps following upon the disturbance of wind, bird, etc., and hiding during the day under some clod, chip, or other protection which might lie on the ground close by the tree. This fact, discovered by Mr. RANSOM of St. Joseph, Michigan, gave rise to the Ransom or chip-trap. This consists of laying pieces of bark or chips close about the base of the tree trunk. The beetles will hide under these and can be collected and killed. Boys can be hired to do this cheaply each day, and if paid by the hundred for their captures, they will probably let few escape. Some of our Michigan peach-growers have practiced this method and praised it highly. But the fact that few of our plum and

peach-growers practice it even in the early season. seems to show that it also fails in actual practice.

CHICKENS AND STOCK.

The same habit of falling to the ground, and a general timidity, gives us another method of combatting this enemy. Thus it is often found that by keeping a large flock of poultry among the trees, or even many hogs or sheep, a full crop of fruit can be secured each year. In this case the insects are eaten up, trodden on, or frightened away. I know of farmers who have in this way secured full crops of plums with almost no exception, while neighbors have secured no plums at all. Often a tree close by a door or path bears heavily each year, while others not thus situated suffer severely. Here the insects are probably frightened away.

PLANTING PLUM TREES.

As before stated, the pear, apple, cherry, and often the peach can be secured against attack by planting *numerous* plum trees *among* the others. The curculios prefer the plums, and attack these in preference to the other fruit. I have seen cherries and apples saved in this way repeatedly, while orchards not far removed, with no plum trees, suffered serious injury. As our wild fruit trees are more and more cut down, this method will be more and more valuable.

THE JARRING METHOD.

This old reliable method, first suggested, I think, by the father of J. J. THOMAS, the venerable and distinguished pomologist, of Union Springs, New York, is today the surest, cheapest, and best method to banish the curculio and save our plums. With this we can let the curculio work till the fruit is sufficiently thinned, when we can proceed to jar, and surely—no doubt in this method—save our fruit beautiful and sound. As we have seen, the curculio often spends the day on the ground beneath the tree. Jarring, then, must be done either late in the evening or very early in the morning; as late or as early as we can see to work. If in the evening, the early morning nap is not cut short, and the dew is not so troublesome. As we have seen, the time to jar is from the time the calix falls from the tree—about May 20, in central Michigan—till the first brood of weevils are all gone—about July 1, at this place. In rare cases it may be well to jar later if the punctures of the plums by the second brood are threatening, else the plums may rot because of such punctures. The number of times required to jar will vary. Often it will not exceed ten or fifteen for the entire season. If, upon jarring, we find we get only one or two, or better, no specimens, we can then safely omit a day, and if the next jarring is equally fruitless we may omit two days. If we jar each year, and gather and destroy the fallen fruit, as soon as it falls, the work will, I think, be less and less each successive year.

The method of jarring is, in short, to place a sheet under the tree and give the tree, or, in case it is quite large, each branch a quick, sharp blow. The insects fall to the sheet and are easily gathered and crushed.

The sheet may be mounted on one or two wheels like a wheel barrow, in case of large orchards. The frame holding the sheet may be so made

as to give the form of an inverted umbrella, and a narrow opening opposite the handles will permit the center of the sheet to reach the trunk of the tree. A cheaper, simpler and more common arrangement is to have two sheets on light rectangular frames, which when brought side by side will form a square large enough to catch anything that may fall from a tree under which the sheet is placed. If each frame has a square notch in the center of one side they may be brought close together about the trunk of the tree so that the sheets will surely catch whatever may fall. With two men to carry these frames and a third to do the jarring, the work proceeds with great speed. Less than a minute is required per tree. In case one has only a few trees, and no help, the sheet may be square, and slitted from the middle of one side to the center. Opposite this side it is tacked to a light slender piece of wood, and opposite this it is tacked to two similar strips, each one half the length of the side. This makes it easy to carry the sheet, to place it entirely around the tree, and to roll it up, in case we wish to set it away in barn or shed. Of course the sheet should always be large enough to catch all that falls from the trees.

The mallet with which we strike the tree or limb should be well padded and carefully used so as not to wound the tree, or may be iron or wood unpadded, in which case a bolt or spike is driven into the tree to receive the blow. Sometimes a limb may be sawed off to receive the blow. I have used the padded mallet successfully for years with no injury to the trees. I find that I can fell all the beetles to the sheet with such a mallet. Unless we are very careful, however, in the use of the padded mallet we may do serious damage to the trees.

When two carry the sheet, and a third party uses the mallet, we may jar several trees before we stop to catch and crush the insects.

It is usually cool at the early or late hour, and the insects are rather sluggish and will generally remain motionless for some minutes. If one uses a sheet like the last described above, it is perhaps best to kill the insects each time after jarring. In case of the wheel-sheet there is sometimes a box placed at the center and the inclined sheet makes it possible to shake the beetles from the sheet into this box. I am not sure but this is better in theory than in actual practice. The curculio may be brushed into a vessel containing kerosene or crushed between the thumb and finger.

The expense of jarring will of course depend upon the excellence of the apparatus and upon the skill and quickness of the operators. Our largest and most successful plum-growers in Michigan estimate the expense at about ten cents per tree. I inquired of several of our best pomologists and the estimates ran from five to fifteen cents per tree per season. Surely, this is not an extravagant amount.

In conclusion let me say that I believe it would pay all our fruit-growers to set plum trees thickly among the other fruit trees of the orchard, and then to fight this insect as described above. This will not only secure a fine and very profitable crop of this luscious fruit, but will at the same time tend to protect the other fruits from this scourge of the careless orchardist, with no extra expense.

INSPECTION OF COMMERCIAL FERTILIZERS.

By R. C. KEDZIE. Bulletin No. 64, Chemical Department.

The law in this state requires the analysis every year of all commercial fertilizers sold or offered for sale, the retail price of which exceeds ten dollars per ton, and the publication of the results of analysis. The materials to be determined in such analysis are "nitrogen in available form, potash soluble in water, phosphoric acid in available form, and the insoluble phosphoric acid." The chemists of Europe and America have selected these same materials as determining the chief value of commercial fertilizers, and in every state of our Union where the law prescribes chemical analysis of commercial manures as one condition of sale, these are the materials to be determined as the basis of value.

These are not the only materials concerned in raising crops, *but they are the only materials for which the farmer can afford to pay more than ten dollars per ton.* These substances are all contained in stable manure, but such stable manure is not sold in the open market for more than ten dollars per ton, nor could the farmer afford to pay such price for this manure, and therefore no analysis of such manure is required by law. There are other materials required for the growth of crops, such as lime, magnesia, oxide of iron, sulphates, etc., but these are constituents of all good soils, and if required in excess of what is in the soil, can be bought for much less than ten to twenty dollars per ton. A man who buys at twenty dollars per ton what can be bought for three dollars per ton is not wisely investing his money. Plaster and salt are very cheap in this state and need not be purchased at inflated prices. Lime and the silicate of lime, alumina and silicate of alumina, magnesia, and oxide of iron, make up the great bulk of the soils of Michigan, and *the farmer does not need to buy his soil materials at twenty dollars per ton.* Land is bought and sold by the acre, not by the ton. An acre of land, taken to the depth of one foot, weighs about 2,000 tons. To buy the chief materials of our soil, even at the rate of ten dollars per ton, would be buying soil at the rate of \$20,000 per acre, which is too high a price for even Michigan lands. Because silica, lime, magnesia, and oxide of iron are found in all agricultural plants, and many of these are essential for the growth of plants, it does not follow that we shall profitably purchase these materials for manures at inflated prices, when we find that all arable soils contain these substances by hundreds of tons.

The case is different with materials that are found in very small amount in the soluble or available form in the soil, and which are soonest exhausted by cropping, such as available nitrogen, potash soluble in water, and phosphoric acid. Under certain conditions the farmer may find a profit in buying and using commercial manures containing these substances, even at prices demanded for commercial fertilizers, but it does not follow that he may with equal wisdom buy all the other materials contributing to plant growth and at the same high prices, while they are found in abund-

ance in his soil, or may be purchased at very small prices in the open market. The rare and precious have a price of their own, which the base and common may not attain. Potash and lime are both necessary for plant growth; the latter is cheap and common, while the former is costly and precious, and prices must vary accordingly.

OBJECT OF INSPECTION OF COMMERCIAL FERTILIZERS.

The law does not prescribe any standard for the composition of a commercial fertilizer, the manufacturer being free to make his own standard, the law simply requiring that the fertilizers offered for sale shall be up to the standard set up by the manufacturer. The license to sell does not certify to the value of the fertilizer, but simply states that the manufacturer or dealer offers for sale a fertilizer for which a certain content of nitrogen, potash, and phosphoric acid is claimed, and that samples of such fertilizers have been deposited with the secretary of the college with affidavit regarding the composition. Analysis is then made of each of these fertilizers, gathered in the open market as far as possible, and the results of such analysis published in bulletin. The *claimed* composition and *found* composition are arranged in parallel lines, so that the real composition can be compared at a glance with the composition claimed for it by manufacturer. In this way the buyer can see at once by this bulletin whether the fertilizer is as good as it claims.

To find the market value, calculations can be made on the basis that available nitrogen is worth nineteen cents per pound, soluble or available phosphoric acid eight cents, insoluble phosphoric acid two cents, and potash from four and one half to six cents, according as it is in the form of chloride or sulphate. These prices are determined each year by the prices of substances from which these materials are derived in the great commercial centers, *e. g.*, New York.

The composition is given in parts in one hundred. To obtain the number of pounds in a ton we multiply the per cent. by twenty. If we multiply the number of pounds in a ton by the price of each material the sum will give the value of a ton of fertilizer. Take an example in a superphosphate made in this state:

Ammonia.....	2.99 %	$\times 20 = 59.8$	lb in ton, @ 6c =	\$11 36
Available phosphoric acid.....	8.02 %	$\times 20 = 160.4$	lb @ 8c =	12 83
Insoluble phosphoric acid.....	2.24 %	$\times 20 = 44.8$	lb @ 2c =	90
Potash soluble in water.....	1.68 %	$\times 20 = 33.6$	lb @ 6c =	2 02
Market value, equals				\$27 11

The whole value of a ton of superphosphate seems to be determined by a little less than 300 pounds of the material. The remaining 1,700 pounds may be considered as made up as follows:

The 205 pounds of phosphoric acid would require 447½ pounds of bone phosphate, or tricalcic phosphate, and this converted into superphosphate and sulphate of lime would make 782½ pounds of lime salts.....	782.5
The nitrogen would require 374 pounds albumenoids.....	374.0
The potash as sulphate.....	66.5

Bones contain 25% carbonate, etc., of lime, as sulphate	350.0
Moisture and excess of sulphuric acid	195.0
Total	1,768.0
Dirt, charcoal, etc.	232.0
	2,000.0

If we take a fertilizer with one per cent. of insoluble phosphoric acid, three per cent. soluble potash, and no available nitrogen, the commercial value, as estimated above, would be \$4.00 per ton. If it had only one tenth these amounts the value would be 40 cents per ton, if estimated in the same way.

Farmers can easily estimate the commercial value of fertilizers by using these data.

LICENSE REQUIRED.

A license is required from each dealer who sells or offers for sale any commercial fertilizer, the price of which exceeds ten dollars per ton. This license must be taken out each year for each brand of fertilizer offered for sale. The amount sold is not contemplated by the law. The lawful sale of any amount will require a license. The license is for one year in each case, commencing with the first of May. The application for a license, the fee for the same (\$20.00), and the specimens of fertilizers, with the affidavit, should be sent to Secretary H. G. REYNOLDS, at the college, by the 1st of May each year.

R. C. KEDZIE,

Chemist, Experiment Station, Agricultural College.

Result of analysis of commercial

Manufacturer.	Trade Name.	Dealer and Locality.
Crocker's Chemical Works, Buffalo, } New York.....}	Queen City Phosphate	Manufacturer
Crocker's Chemical Works, Buffalo, } New York.....}	New Rival Ammoniated Bone } Superphosphate.....}	S. Lathrop, Richmond, Mich....
Crocker's Chemical Works, Buffalo, } New York.....}	Ammoniated Wheat and Corn } Phosphate	S. Lathrop, Richmond, Mich....
Crocker's Chemical Works, Buffalo, } New York.....}	Vegetable Bone Superphosphate.	Manufacturer ..
Crocker's Chemical Works, Buffalo, } New York.....}	Potato, Hop and Tobacco Phos- } phate.....}	Manufacturer
Crocker's Chemical Works, Buffalo, } New York.....}	Special Potato Manure	Manufacturer
Crocker's Chemical Works, Buffalo, } New York.....}	Ammoniated Bone Superphos- } phate.....}	S. Lathrop, Richmond, Mich....
Crocker's Chemical Works, Buffalo, } New York.....}	Buffalo Superphosphate No. 2...	S. Lathrop, Richmond, Mich....
Crocker's Chemical Works, Buffalo, } New York.....}	Pure Ground Bone.....	J. M. Isbell & Co., Jackson
Michigan Carbon Works, Detroit	The Homestead Superphosphate.	A. H. Whitehead, Lansing.....
Michigan Carbon Works, Detroit	The Jarvis Drill Phosphate.....	A. H. Whitehead, Lansing.....
Michigan Carbon Works, Detroit	Jarves Celery Grower.....	George Hancock, Grand Haven.
Michigan Carbon Works, Detroit	Homestead Potato Grower.....	O. Palmer, Grayling
Northwestern Fertilizer Co., Chicago.	\$26 Phosphate.....	Bially & McDonell, Bay City....
Northwestern Fertilizer Co., Chicago.	Garden City Superphosphate....	C. A. Slayton, Tecumseh.....

*fertilizers in Michigan for 1890.*Composition of Fertilizers as Claimed by Manufacturer and as found on Chemical Analysis.
Percentage Estimation.

	Available Nitrogen.	Phosphoric Acid.			Potash.—Soluble in Water.	
	Estimated as NH ₃	Available P ₂ O ₅	Insoluble P ₂ O ₅	Total P ₂ O ₅ .	Estimated as K ₂ O.	Estimated as K ₂ SO ₄ .
{ Claimed ----- Found -----	2 to 2½ 2.36	8 to 12 9.59	1 to 2 1.29	9 to 14 10.85	1 to 2 2.18	2 to 4 4.03
{ Claimed ----- Found -----	1½ to 2½ 1.82	10 to 12 7.59	1 to 2 3.41	11 to 15 11.00	1.6 to 1.7 2.00	3 to 5 3.70
{ Claimed ----- Found -----	2½ to 3½ 3.00	10 to 13 9.58	1 to 2 1.08	11 to 15 10.66	1.6 to 2.7 2.08	3 to 5 3.75
{ Claimed ----- Found -----	6 to 7 4.00	6 to 8 7.14	1 to 2 .89	7 to 10 8.03	6 to 8 6.71	11 to 15 12.41
{ Claimed ----- Found -----	2½ to 3½ 3.65	8 to 12 6.25	1 to 2 1.85	11 to 14 8.1	3½ to 4½ 5.00	6 to 8 9.25
{ Claimed ----- Found -----	4½ to 5½ 5.41	8 to 9 7.72	1 to 2 3.06	9 to 11 10.78	5½ to 6½ 6.41	10 to 12 11.86
{ Claimed ----- Found -----	3½ to 4½ 4.00	10 to 13 11.64	1 to 2 2.00	11 to 15 13.64	1 to 2 1.83	2 to 3 3.35
{ Claimed ----- Found -----		11 to 13 12.19	1 to 2 1.06	12 to 15 13.35	1 to 2 2.00	2 to 4 3.70
{ Claimed ----- Found -----	3½ to 4½ 5.00			25.00 22.39		
{ Claimed ----- Found -----	1.85 to 2.40 2.00	7½ to 11 7.79	----- 4.74	7½ to 11 12.53	----- 1.35	2.75 to 3.50 2.60
{ Claimed ----- Found -----	1¼ to 2 2.19	7½ to 9½ 4.42	2 to 3 4.78	9½ to 12½ 9.20	----- -----	.5 to 1 .75
{ Claimed ----- Found -----	1.00 2.82	1.00 11.33	1.00 .31	2.00 11.64	1.00 .96	----- -----
{ Claimed ----- Found -----	3 to 4 4.08	8 to 11 10.52	½ to 1½ .78	8½ to 12½ 11.30	----- 4.34	6½ to 7½ 8.25
{ Claimed ----- Found -----	1½ to 2 2.12	6 to 8 6.57	7 to 9 8.00	13 to 17 15.50	----- -----	----- -----
{ Claimed ----- Found -----	2 to 3 2.18	8 to 9 8.85	4 to 4½ 4.15	12 to 13½ 13.00	.54 to 108 .50	----- -----

Result of Analysis of Commercial Fertilizers

Manufacturer.	Trade Name.	Dealer and Locality.
Northwestern Fertilizer Co., Chicago.	Celery Grower.....	Manufacturer
Northwestern Fertilizer Co., Chicago.	Prairie Phosphate.....	C. A. Slayton, Tecumseh.....
Northwestern Fertilizer Co., Chicago.	Fine Raw Bone	C. A. Slayton, Tecumseh.....
Cleveland Dryer Co., Cleveland, Ohio	{ Buckeye Ammoniated Bone } { Superphosphate..... }	L. B. Spencer, Holloway.....
Cleveland Dryer Co., Cleveland, Ohio	Ohio Seed Maker.....	E. W. Spencer, Petersburg.....
Cleveland Dryer Co., Cleveland, Ohio	Sandy Soil Fertilizer.....	E. W. Spencer, Petersburg.....
Cleveland Dryer Co., Cleveland, Ohio	Square Bone.....	B. E. Niles, Blissfield.....
Thompson & Edwards, Chicago, Ill...	World of Good.....	V. C. Wattles, Battle Creek.....
Thompson & Edwards, Chicago, Ill...	Pure Fine Ground Bone.....	V. C. Wattles, Battle Creek.....
Thompson & Edwards, Chicago, Ill...	Sure Growth.....	Essley & Pinchin, Plainwell...
Thompson & Edwards, Chicago, Ill...	Bone Meal, Pigs Foot Brand.....	Essley & Pinchin, Plainwell...
H. S. Miller, Newark, N. J.....	Harvest Queen.....	C. T. Harris, Ypsilanti.....
H. S. Miller, Newark, N. J.....	Chanticleer.....	C. T. Harris, Ypsilanti.....
H. S. Miller, Newark, N. J.....	Ground Bone.....	C. T. Harris, Ypsilanti.....
Bradley Fertilizer Co., Boston, Mass..	Disolved Bone with Potash.....	Manufacturer
Bradley Fertilizer Co., Boston, Mass..	B. D. Sea Fowl Guano.....	Manufacturer

*in Michigan for 1890.—Continued.*Composition of Fertilizers as Claimed by Manufacturer and as found on Chemical Analysis.
Percentage Estimation.

	Available Nitrogen.	Phosphoric Acid.			Potash.—Soluble in Water.	
	Estimated as N H ₃ .	Available P ₂ O ₅ .	Insoluble. P ₂ O ₅ .	Total P ₂ O ₅ .	Estimated as K ₂ O.	Estimated as K ₂ SO ₄ .
{ Claimed { Found.....	3 to 4 4.03	7 to 9 6.72	----- 4.15	7 to 9 10.87	----- 2.59	2 to 3 5.01
{ Claimed { Found.....	1½ to 2 2.00	6 to 8 7.46	9 to 11 4.9	15 to 19 12.36	.12	-----
{ Claimed { Found.....	3 to 4 4.93	-----	-----	22½ to 25 19.20	-----	-----
{ Claimed { Found.....	3 to 4 3.10	9 to 10 10.00	2.00 3.62	11 to 12 13.61	1 to 2 1.27	-----
{ Claimed { Found.....	1½ to 2½ 2.25	10 to 12 11.07	5.00 4.66	15 to 17 15.73	-----	-----
{ Claimed { Found.....	3 to 4 3.31	9 to 11 10.39	2.00 4.00	10 to 13 14.39	2 to 4 .80	-----
{ Claimed { Found.....	3 to 4 4.34	6 to 10 10.50	14 to 15 7.50	20 to 25 18.00	-----	-----
{ Claimed { Found.....	2 to 3 3.30	8 to 10 5.34	4.00 3.50	12 to 14 11.84	----- 2.84	3 to 4 5.02
{ Claimed { Found.....	3 to 4 3.99	-----	-----	22 to 25 16.96	-----	-----
{ Claimed { Found.....	1 to 2 2.89	-----	-----	14 to 16 13.25	1 to 2 1.27	-----
{ Claimed { Found.....	2 to 3 1.61	-----	-----	9 to 13 11.53	1 to 2 .42	-----
{ Claimed { Found.....	1 to 2 1.37	10 to 12 10.91	----- 1.27	----- 12.18	----- 1.48	1½ to 2 2.25
{ Claimed { Found.....	1 to 1½ 1.1	6 to 7 5.44	1 to 2 4.56	7 to 9 10.00	2½ to 3 3.87	-----
{ Claimed { Found.....	2 to 3 3.65	-----	-----	12 to 14 12.18	-----	-----
{ Claimed { Found.....	1 to 2 1.70	8 to 10 10.18	----- 1.02	10 to 12 11.20	----- 2.18	4 to 6 4.01
{ Claimed { Found.....	2½ to 3½ 3.14	8 to 10 14.62	----- 2.23	10 to 12 16.85	1½ to 2½ 2.71	2¾ to 4¾ 5.00

Result of Analysis of Commercial Fertilizers

Manufacturer.	Trade Name.	Dealer and Locality.
W. S. Dunbar, St. Joseph, Mich.....	Meat and Bone Fertilizer	I. D. Bixby & Son, Kalamazoo..
W. S. Dunbar, St. Joseph, Mich.....	Fish Guano.....	I. D. Bixby & Son, Kalamazoo..
Western Union Chemical Co., Cleve- } land, Ohio..... }	Empire Superphosphate.....	Manufacturer
Western Union Chemical Co., Cleve- } land, Ohio..... }	International Phosphate.....	J. W. Hicks, Richmond.....
Joseph Lister, Chicago, Ill.....	Pure Ground Bone Meal.....	A. C. Glidden, Paw Paw.....
John Taylor, Trenton, N. J.....	Special Potato Fertilizer.....	Manufacturer.....
Lister's Agricultural Chemical } Works, Newark, N. J..... }	Lister's Success.....	A. & H. Wilcox, Jackson.....
Jarecki Chemical Works, Sandusky, } Ohio..... }	Lake Erie Fish Guano.....	Crane & Son, Adrian.....
Western Reserve Fertilizer Co., } Mineral Ridge, Ohio..... }	Western Reserve Fertilizer.....	A. & H. Wilcox, Jackson.....
Northwestern Chemical Co., Mil- } waukee, Wis..... }	Superphosphate.....	John Mueller, Warren
Farmers' Fertilizer Co., Detroit, } Mich..... }	Farmers' Superphosphate.....	Office, 23 Woodbridge street, } Detroit
Cleveland Dryer Co., Cleveland, } Ohio..... }	Ammoniated Dissolved Bone....	L. B. Spencer, Holloway.....

*in Michigan for 1890—Continued.*Composition of Fertilizers as Claimed by Manufacturer and as Found on Chemical Analysis.
Percentage Estimation.

	Available Nitrogen.	Phosphoric Acid.			Potash.—Soluble in Water.	
	Estimated as N H ₃ .	Available P ₂ O ₅ .	Insoluble P ₂ O ₅ .	Total P ₂ O ₅ .	Estimated as K ₂ O.	Estimated as K ₂ SO ₄ .
{ Claimed	7.60			16.00		
{ Found	6.17			9.60		
{ Claimed	8.19			14.00		
{ Found	7.06			4.28		
{ Claimed	1¼ to 2½	9 to 12	3 to 5	12 to 17		
{ Found	1.83	10.30	4.09	14.37		
{ Claimed		12 to 14	2 to 4	14 to 18		
{ Found		12.80	3.20	16.00		
{ Claimed	3.70	7.30	17.35	24.65		
{ Found	4.11	6.30	19.15	25.75		
{ Claimed	2½ to 3½			8 to 10	10 to 11	
{ Found	3.41	9.17	.83	10.00	9.03	
{ Claimed	1¼ to 2	10½ to 12				1½ to 2
{ Found	2.63	9.94	3.66	13.60		2.00
{ Claimed	2 to 3	11 to 12	1 to 2	12 to 14	1 to 2	
{ Found	2.4	9.97	3.60	13.57	.66	
{ Claimed				trace to 2	trace to 2	
{ Found .....				.10	.30	
{ Claimed	2 to 3	8 to 10				1 to 2
{ Found	2.52	7.75	5.75	13.50		1.00
{ Claimed	2½ to 3¼			8 to 11		2¾ to 3½
{ Found	3.06	4.19	1.41	5.60	.81	1.50
{ Claimed	1½ to 2½	10 to 12		15 to 18	1 to 2	
{ Found	2.63	9.20	4.00	13.20	.37	

SPECIAL PLANTING FOR HONEY.

By A. J. COOK. Bulletin No. 65, Zoölogical Department.

It is a well-known fact, and as thoroughly appreciated by the thoughtful bee-keeper, that often because of some peculiar condition of the weather, even our best honey plants fail to secrete nectar. In Michigan the years 1888 and 1890, and to less degree 1889, gave excellent illustrations of this fact in respect to white clover.

Again, it frequently occurs that a drouth or over-production the previous season, so weakens plants they do not develop to the blossoming stage, or do not produce blossoms. This very season, 1890, gave us almost no bass-wood bloom. The same truth is illustrated not infrequently by almost all of our nectar-secreting plants.

Once more, there are times in every season and region, when there is a dearth of nectar-secreting flowers. In Michigan this period comes about July and August, usually from about July 15 to August 15. At this season, there are neither native honey plants in bloom, nor are there honey plants in cultivation. So at this season the bees are idle, and robbing a common occurrence.

For the above reasons bee-keepers are much interested to know if there are plants that will always secrete nectar irrespective of weather; plants that will secrete not simply enough to attract bees, but enough to give a surplus and insure a profit. They are also practically interested in knowing whether or not there are plants that will secrete so liberally that it will pay to grow them for honey alone. It is further a matter of importance to find if there are plants that bloom at the time of the honey-dearth in July and August, and so valuable to grow, either for honey alone or for honey and other purposes. There are always more or less waste places, by road sides, along railways, etc., near by most apiaries. It is important to know if it will pay to utilize such by planting for honey, and if so, to know what to plant.

That these are important matters for investigation is clear from the fact that many bee-keepers have spent considerable sums in trying to solve these questions.

It is clear, that to arrive at any definite and reliable conclusions, experiments must be tried on a large scale. We must not see simply that bees work on the flowers, but we must get results. We must be assured that the bees actually store, and that in paying quantities.

It occurred to me, and to the board of our Michigan experiment station, that this was a very proper subject for investigation at our station, and so for the past two seasons we have devoted about fourteen acres to this purpose. The seasons have been very opportune, as there was an almost total failure in the honey harvest both years, so if any plan adopted was a success, it would have ample chance to prove its excellence.

I decided to try the three following honey plants: Rocky Mountain Bee Plant (*Cleome integrifolia*), Chapman Honey Plant (*Echinops sphaerocephalus*), and a foreign mint of the genus *Melissa*. I hoped

to find a plant that would secrete nectar every year, especially in times of drouth, that would grow with little or no care on the part of the bee-keeper, and would yield bountifully of nectar. As the Chapman honey plant was loudly praised, and was reported a success upon actual trial, and as the seed had been distributed by the government, it occurred to me that it should be one of the plants first tested. The Rocky Mountain bee plant flourishes on the dry plains of Colorado, where it is said to give prodigious yields of nectar, and as I had been quite successful in growing it in small plats for years, where it seemed to attract the bees from early July till frost, I looked upon that plant as well worthy a trial. This plant is also reported as growing wild in Wisconsin and Minnesota, and as affording much nectar. The *Melissa* belongs to the mint family—a family of honey plants—is strongly praised by those who have tried it, and who have no pecuniary interest in its becoming popular, so I conclude to make it third in the list to be adopted.

THE CHAPMAN HONEY PLANT.



FIG. 1.—*Chapman Honey Plant.*

I have planted in all four or five acres of the seed of this plant, some on clay and others on sand. When the seed came the plants made a very vigorous growth, but did not blossom at all the first year. Thus the plant is a biennial. No nectar can be secured from it till the second year after planting. The plant (Fig. 1) looks like a thistle, the spines doubtless suggesting the generic name *Echinops*. The flowers form a very perfect globe or sphere, hence the specific name *spherocephalus* is very appropriate. The plant, if cultivated till once well started, will care for itself, as it is very vigorous. It begins to bloom here at the Michigan Agricultural college about the middle of July, and continues to blossom till the middle of August. The blossoms commence to open at the lower margin of the head, and continue to open toward the centre. The seasons have been very dry, yet the bees visited the *Echinops* very freely, and secured considerable honey, and this too just at the most desirable period of the year.

A very serious objection to the general adoption of this plant is the difficulty of securing the seed. The chaff has barbed awns, that are very minute. These fly everywhere as we clean the seed, and except one is protected better than he will be unless previously taught by experience, these awns are sure to enter the eyes and pierce the skin at every possible opportunity. The effect of this is almost maddening. For three or four days, the pain in the wounded eyes and skin is almost unendurable.

After the plants bear a full crop of seed, they seem exhausted, and very few survive to blossom the second year. Our plants in 1889 were wonderfully fine and vigorous; the plants on the same area this year are very few and scattering. To be sure, young plants have come up thickly from seed; but they will bear no bloom till 1891. Thus we see that we can not grow

this plant profitably except as we plant, or permit it to self-plant, every year, and also that we get no honey till the second season from the seed.

Another serious difficulty is the chance that the seeds may not come. I planted five acres of seed this spring. The seed seemed excellent, the ground was in fine condition, and we had frequent and abundant rains. Yet so few of the seeds came that I plowed all up and sowed to buckwheat.

We see, then, that the special planting for honey alone of the *Echinops* is not encouraging. The fact that the plant is a biennial, that it is so terrible to thresh, that the seed is likely to fail to germinate, and the fact, if we may judge from analogy, that the plant may not always secrete nectar, even though it bloom profusely—our experiments do not prove or refute this point—all would tend to make the wise bee-keeper hesitate before he grew this plant. It seems more than probable that it will never pay to do so.

THE ROCKY MOUNTAIN BEE PLANT.

I had previously learned that to grow *Cleome* we must plant in autumn. Spring-sown seed will rarely germinate. So in the fall of 1888 I sowed eight acres of *Cleome*. The seed was procured fresh from Colorado. To my great disappointment, the seed did not germinate well. In many places the plants were exceedingly scattering. These plants were on sandy land. Other seed was planted on clay and did not germinate nearly as well as that sown on the sand. The blossoms commenced to open the first of July, and continued to bloom even into September. The season was very dry, the excessive drouth reaching from July till late autumn, just the time for a Colorado plant to show its virtues. The plant (Fig. 2) grows from one to three feet high, the foliage is smooth, the leaves compound, and the flower an umbel. The flowerets commence to open below and continue for a long time.

To my great disappointment, the flowers seemed to furnish very little nectar. The bees worked on the plants only occasionally and then not excessively. Thus there were two disappointments: failure of the seeds to germinate, and failure of the flowers to secrete.

We sowed in 1889 three acres with seed of our own raising, which failed almost entirely to germinate. We left three acres uncultivated where the plants were thickest in 1889, to see if the plants would self-seed the ground. Here, too, we were disappointed. There were so few plants, even though the season seemed exceptionally favorable, that both pieces, the one planted and the one supposed self-sown, were plowed up.

FIG. 2.—*Rocky Mountain Bee Plant.*

Thus these plants, like the *Echinops*, two as promising species as we could hope to find, promise little in the way of special planting exclusively for honey. The expense and labor, the doubt of growing a crop, even though we plant, the chance that the season may not be propitious, and so there be little or no nectar secreted, even though the plants do grow and bloom, all this makes the prospects for profit in such planting not encouraging.

MELISSA.

The *Melissa* is an annual. We planted it for two successive years. It did well, blossomed freely, and was visited very generally by the bees. It grows well on both sand and clay, and by sowing early will commence

to bloom early in July and continue in bloom for a month or more. I regret to say that it will not self-seed, and must be planted annually. This is expensive, and it is doubtful if it will pay. It is to be said, however, that Melissa, in common with the other mints, seems to attract the bees at all times of bloom, whatever the season. So I am of the opinion that if any plant will pay, exclusively as a honey plant, it will be some mint. Many of these are perennial. As the three acres of Melissa last season was singing with bees all through the time of blossoming, and as our bees swarmed in early August, a thing unprecedented in Michigan, it gives reason to hope that with a large average we might secure a honey crop each year despite the season.

Thus I believe our experiments indicate that special planting for honey alone is of doubtful practicability; that Echinops and Cleome, at least, are not the plants for such special planting, if it is ever to be a success, and that while Melissa, or bee balm, is not profitable, as it is an annual, it is possible that the perennial mints are the plants, if any such there be, that will pay us to grow exclusively as honey plants.

Unless Cleome will seed itself, it is not the plant even for wayside planting. I think we must look to some of the persistent mints, or, more probably, to some plant valuable for other purposes, even to plant on the roadside and in waste places.

I hope next to try Melilot, or sweet clover, not so much to find whether it is a valuable honey plant, as we know that now, but rather, to find if this luxuriant and vigorous clover may not have other important uses, possibly for silage. I shall also hope to plant small beds of promising mints in hope of hints of some plant that will pay just for nectar and nothing else.

POTATOES.

By E. DAVENPORT. Bulletin No. 60, Farm Department.

Fifty-five varieties of potato were grown by the farm department in 1889 upon the sandy loam in the experimental field. The soil was in good condition, but the dry season to some extent shortened the crop.

Thirty-seven varieties were grown in quantity and were thoroughly tested by eight of the families upon the grounds. The remaining sorts were grown in small quantities and will be further tested the coming season.

The testing continued from November to March. Color, grain, mealiness and flavor of the potatoes, both baked and boiled, were considered in the markings, which were upon the scale of 10. In no case was the name of the potato known to the tester, and the table fairly represents the opinion of eight different families upon the sorts tested as designated to them by numbers and not by names. The apparent differences in taste and preference are often striking, as will be seen by study of the table both horizontally and vertically. It contains 114 tests—an average of over three for each variety.

The planning and entire management of these tests have been in the hands of Mr. P. G. HOLDEN, Experiment Station Assistant, to whom great credit is due for so original and thorough a method of comparative tests.

TABLE.

Name.	Color.	Size.	Surface.	Maturity.	Yield per acre in bu.			Judges.								Average.
					Marketable.	Not Marketable.	Total.	1	2	3	4	5	6	7	8	
Alexander's Prolific	W	L	fs	M	164	7	171		9½			9			7	8.50
American Giant	W	V L		M	190			10					9	8		9.00
Beauty of Hebron	R	M	r	M	152	22	174	10	9		6					8.33
Burbank Seedling	W	M	s	L	127	6½	131	8	10		10		8	8	9	9.00
Charles Downing	W	M	s	M E	*	*	*		9		10					9.50
Clark No. 1	R	M	s	M	157	26	183					4			6	5.00
Chicago Market	R	M	fs	E	160	20	180					9		8		8.80
Dakota Red	red	L	s	L	211	13	224	8	9½		8½		6	6	9½	7.91
Early Albino	W	M	r	E	162							5			10 7½	7.42
Empire State	W	M	s	M E	173	30½	203½					9.80	10			9.90
Early Harvest	R	M	fs	E	182	9	191	7½		9						8.25
Early Maine (1)	R	L	fs	E	173	12	185	9		6½					8	7.83
Early Ohio	R	M	s	E	146	7	153	6				7		8	9	7.50
Early Sunrise	R	M	r	E							7					7.50
Early Telephone	W	M	s	E M	155	13	168	10			8	9½		9	10	9.30
Early Mayflower	W	M	s	M	138	14	152	8	8½	8	9					9.00
Garfield	W	M	s	M E					9½			10	10			9.83
Green Mountain	W	V	fs	M L							10			9		9.50
Hall's Early Peachblow	R	M	r	L				7		5½					5	5.83
Lee's Favorite	R	M	r	E	110	24	134	3	6		6					5.00
Mammoth Pearl	W	V	r	M L	206	16	222		8			7		5	9	7.25
Monroe Seedling	W	M	s	M					10							10.00
New Badger State	W	L	s	M								7½			8½	8.12
Ohio Junior	R	M	s	E	153	10	163	8		8½		9		9	9	8.70
Pearl of Savoy (2)	R	M	fs	E	155	25	180		9		8			9		8.66
Polaris (2)	W	M	s	E	156	12	168	9		6½		8				7.83
Puritan	W	M	r	E					9½		8½					9.50
Rochester Favorite	W	L	fs	L	142	15	157		10		9½					9.75
Rural Blush	red	M	r	L	166	9	175				8		8			8.00
Rural New Yorker No. 2	W	L	s	L					9½					9½		9.50
Seneca Beauty	R	M	fs	L M					10		9½					9.75
Thorburn	R	L	fs	M E	168	25	193		9	8½	9½	10	8	10	10	9.30
Vick's Extra Early	W	M	s	E	165	14	179					9½	10		9	9.50
Wall's Orange	O	M	r	L	210	10	220	10	7			8½			7	8.12
Watson's Seedling	R	M	r	L	206	15½	221½	5		6		7				7.00
White Elephant (2)	W	M	fs	L	163	9	172					8			6	7.00
White Star	W	M	fs	L M	140	9	149		9			8	8		6	7.75

In the first column W stands for white, R for rose.

In the second column M for medium, L above medium, V L very large, V variable.

In the third column s smooth, fs fairly smooth, r rough.

In the fourth column E early, M medium, L late.

* Where yields are not given only small amounts were grown from samples.

(1) Occasionally black hard spots were found. Prof. Taft thinks it is due to some local influence as he has never known the potato to be affected in this way before.

(2) A few potatoes affected by dry rot were found in the bin.

The following table gives the yields of various roots grown for feeding purposes. It may prove of some interest:

ROOTS.

Name.	Yield per Acre in Tons.	
White Belgian	Carrot,	7.30
Short Horn	"	6.78
Danver	"	6.51
Giant Long Green Top	"	6.25
Altringham	"	5.46
Long Yellow Belgian	"	4.92
Orchendorf	Mangels,	13.23
Obendorf	"	13.21
Long Yellow Mangel	"	11.85
Golden Tankard	"	10.42
Norbiton Giant	"	10.35
Lane's Improved Sugar	Beet,	10.14
Red Globe	Mangel,	9.34
Vilmorin's Improved White	Beet,	8.12
Mammoth Golden	Mangel,	6.82
American Ruta Baga	Bagas,	13.05
Bloomdale Sweede	"	12.28
White Russian	"	11.61
Yellow Sweede	"	11.44
Skirvinge	"	10.64

Below is a table giving yields, etc., of various varieties of corn grown for ensilage. We fail, as do others, to secure the best ensilage from the large watery sorts destitute of ears:

CORN FOR ENSILAGE.

Name.	Height in Feet.	No. of Ears to 100 Stalks.	Tons per Acre.
Virginia Horse Tooth			15.20
Blount's Prolific			13.82
Sweet Corn	7¾	50	13.73
Thoroughbred White Dent	8½	38	13.50
White Dent No. 2	9½	52	13.30
Yellow Dent	9½	37	12.83
Mammoth White Surprise	9	4	11.61
White Dent No. 3	10	4	11.45
White Dent No. 1	8½	80	11.07
Hathaway Dent	8	40	10.39
Hickory King	9		10.36
North Star	7¾	45	10.22
Queen of the Prairie			9.95
Pride of the North	7½	45	9.91

The table explains itself. It will be seen that ears are not in inverse proportion to yield, and that the smaller sorts may be as productive as the larger.

The within is a partial report of experiments in progress when the department came into my charge. Many of them will be continued further.

Publication has been delayed owing to the desire to carry the potato experiment through the winter. The details have been mainly in the hands of Messrs. Burnett and Holden, to whom proper credit is due.

EUGENE DAVENPORT,

Agriculturist.

AGRICULTURAL COLLEGE, MICH.. }
March 29, 1890. }

THE ENGLISH OR HOUSE SPARROW.

(Passer Domesticus.)

By C. B. COOK. Bulletin No. 62, Zoölogical Department.

From time immemorial the English or house sparrows have been a serious pest in Europe. When the art of writing was invented, this bird was chosen for the hieroglyphic character signifying enemy.

It is strange, considering the well-known reputation of this sparrow, that any one should have desired to import it into America.

That this species is rapidly overrunning the country is a well-known fact. Darwin states that newly introduced species, either of plant or animal, will always outstrip the natives. This fact is exemplified by the English rabbit in Australia, and the cabbage butterfly and English sparrow in America. The close association of these birds with man, their superior intelligence, and their gregarious habits, do much to free them from the sharp competition, to which many of our native birds succumb. The sparrows are hardy and little troubled with disease, while most carnivorous animals that prey upon birds prefer taking native species rather than risk their lives near inhabited dwellings. The food supply that limits the increase of native birds affects the sparrow but little. In winter they have access to corn bins, horse ordure in street and road, chicken and barn yards, while an endless supply of food is found in field and garden during the summer. One of the worst obstacles with which the sparrow has to contend is climate. The cold, wet storms of the north kill many birds that have recently left their nests. However, the great enemy of the sparrow is, or at least ought to be, man. If the bird is not held in check ere long he will overrun the continent to such an extent that agricultural depression will be still further augmented.

The injuries which the sparrows do to the farm and garden vary greatly. Where there are but a few birds to the acre, the damage is slight, but when they number as many thousand then they become a serious nuisance. Buildings and shade trees that are constantly employed for nesting and roosting purposes become foul with their droppings. The injury to shrubs and trees where these sparrows abound is two-fold; first, by their filthy habits, they injure the foliage; and second, they feed extensively on the fruit and blossoms. Where sparrows abound in large flocks, no fruit, grain, or vegetable is exempt from their attack. Most large fruits are destroyed while in the blossom or soon after. The bird picks off two or three petals and then swallows the young fruit. In this way a whole crop of apples, pears, or plums has been quickly destroyed. Also in the east, near some of the larger cities, it has been with difficulty that any grapes have been grown. The kinds of grain preferred are wheat and oats, which suffer the most at the time of harvest. In France it is estimated that ten million bushels of wheat are destroyed annually. In a few cases the sparrow has helped to check the ravages of the army worm and canker worm. However, the sparrow does not eat many insects. The young birds are fed on soft, easily digested food for a few weeks, and at this

period a part of their food consists of insects, but as the young birds grow older they prefer seeds and grain. Without question the English sparrow protects more insects than he destroys, by driving away insectivorous birds. That these foreigners drive away familiar native species there can be no doubt. Particularly do the wrens, martens, swallows, and blue birds suffer, as their nesting places are eagerly sought for and secured by the sparrows. Occasionally the native birds hold their own for a time, but sooner or later they must succumb. Often when necessary the English sparrows will club together to drive away a pair of native birds. Even the robins and pigeons can not withstand numbers, and are obliged to vacate, leaving their eggs and young to be thrown out of the nests and killed. If this were the worst of their attacks, we could still find some excuse for the sparrow; but they have been repeatedly found in the act of destroying, not only the nests but the eggs and young birds of other species with no other purpose than to exclude them from the neighborhood. True, the English sparrow has been seen living on friendly terms with native birds and even nesting side by side with them. but as the sparrows increase in numbers they become more quarrelsome. As yet the greatest amount of injury is done around cities and towns, but as the sparrows increase and migrate into the country, they are sure to take with them the same destructive habits and ugly disposition. There are people in America today who are staunch friends of the sparrows, but usually such persons live in a locality where the sparrows have not yet become a pest. We do not object to a few grasshoppers in Kansas, a few rabbits in Australia, or a few mice in Russia, but when they become so numerous as to eat every green thing, then it is quite another matter.

In a bulletin issued by the Department of Agriculture in 1889, on the English sparrow, it is shown that a single pair of these sparrows may produce in ten years 275,716,983,698. To show that the above figures are not wholly out of bound, we have but to cite the following examples taken from the same bulletin: Norwood Giles of Wilmington, N. C.: "It rears four broods here. Began nesting as early as Jan. 22, this year." H. B. Bailey, of East Prange, N. J.: "It rears five or six broods yearly with four to six young in a brood." Thomas Chalmers, of Holyoke, Mass.: "It rears five broods annually and five birds to a brood. Have known of six broods in a season from one pair. For the last fifteen years the sparrow has spread on an average over 69,000 square miles per year; but their increase is a geometrical ratio. Thus for the first few years the increase must have been comparatively small, while during the last two or three years it has spread faster than in all the previous years. If it is allowed to continue at this rate, what must be the ultimate end?"

Before carrying on any warfare against the English sparrow it is important to be able always to distinguish it from the native birds.

DESCRIPTION OF THE ENGLISH SPARROW. (*Passer Domesticus*.)

The bill is very stout, with its upper and lower lines curved. In the male the upper parts are ashy gray, while the middle of the back is streaked with bay and black. The lesser wing coverts—the short feathers at the base of the wings—are chestnut. The greater wing coverts are mostly black, though each black feather is bordered with chestnut. At the base of the large wing coverts is a white wing bar nearly an inch long. The lower parts are ashy white, with the throat black the latter bordered

on either side by lead-color, which extends to the eye. A conspicuous reddish brown stripe extends backward from the eye separating the gray of the top of the head from that of the cheek. This broadens as it runs back, so that at the base of the neck it forms a dorsal band which extends well down toward the black of the throat, between it and which the gray color is very light—nearly white. In some cases this reddish brown does not meet above at the base of the neck.

The coloration of the female is less definite. The head is brownish gray, becoming lighter on the throat. The back is marked much as in the male, with the chestnut varying to a yellowish brown. The breast varies from an ashy to a yellowish or dirty white. The young male is like the female. The length of both sexes—from the tip of the bill to the tip of the tail—varies from six to seven inches.

HEAD OF ENGLISH SPARROW—MALE.

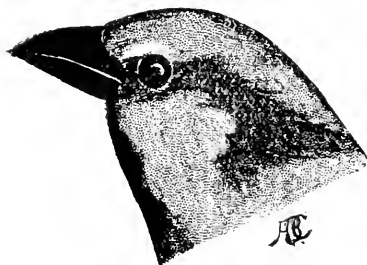


FIG. 1.—Head of Male.

In the female (see fig. 2) the bill is slightly more slender, the color yellowish gray; the crown of the head *always* solid brownish gray, ONE COLOR ONLY, which point distinguishes it from the native sparrows of Michigan. The throat varies but is usually ashy, or grayish white.

NATIVE BIRDS LIABLE TO BE MISTAKEN FOR THE ENGLISH SPARROW.

Purple Finch (*Corpodacus purpureus*). The bill is about the size of that of the English sparrow; the head of the male can *always* be told by the crimson crown; the rest of the head and body is rose red. The head of the female is mottled with brownish gray and darker spots, as is the entire back, and not uniform in color as in the female English sparrow.

Red Polled Linnet (*Aegiothus linaria*). Both male and female of this species may be known by the crimson crown and a small sooty black patch on the throat. Their length is about five and one half inches. Many of this species have been received by town clerks for sparrows. *There is no bright red or crimson on the top of the head of any English sparrow.*

Yellow bird (*Astrogalinus tristis*). The male of this species can be told in summer by his rich yellow color, but the head of the female—and male in its winter plumage—can be told by a brown crown, a yellow throat, and by the small size of its head and bill.

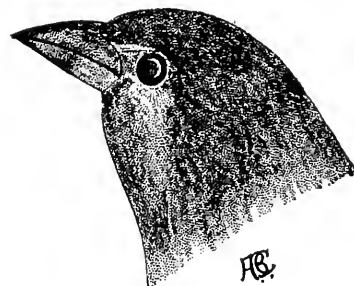


FIG. 2.—Head of Female.

Song Sparrow (*Melospiza fasciata*). Many of these valuable birds have been killed as English sparrows. The song sparrow is about the size of the English sparrow. The crown is dull bay, which is finely marked with black. The bay part of the crown is divided in the middle and bordered on the sides by light strips. The throat is light bordered on either side by a dark brown streak. There are two brown strips on the side of the head, the upper of which extends back from the eye.

The Tree Sparrow (*Spizella monticola*), Field Sparrow (*Spizella agrestis*) and the Chipping Sparrow (*Spizella domestica*), all can be told from the English Sparrow by their reddish brown crowns; the last two are much smaller than the foreigner.



FIG. 2.—Outline of bill of sparrow and cat-bird.

The other common birds of this family (*Fringellidae*) can be easily distinguished from the English sparrow by the description already given of it. While some birds of other families have heads somewhat like the English sparrow, they can always be distinguished from it by the form of the bill. Thus the thrush family (*Turdidae*) all (see Fig. 3) have bills—as in the cut—larger and more slender.

DESTRUCTION OF THE SPARROW.

There are a number of ways to destroy the sparrow. Trapping by means of a bird net is practiced by experts, but the sparrows, considering their numbers, are the most difficult of all birds to catch. The gun is a more ready weapon. In city limits where the sparrows are the thickest this can not be used except by persons having authority to make this their special business. Probably the most successful method is to use poison. Wheat soaked in a solution of strychnine, in a proportion of one dram to a quart of water is one of the most efficient poisons. However, experience shows that this compound is too rapid in its results, as some of the birds begin to be affected before all present have taken a fatal dose and when once scared away by the dying agony of poisoned birds, the others never return. Arsenic mixed with corn or oatmeal in the proportion of one part of arsenic to ten or fifteen parts of meal, by weight, makes a less expensive poison and is more slow in its action, thus giving all birds ample time to get away from the feed before they become affected. In order to obtain the best results the birds should be fed for a few days at first, pure grain of the same kind that is to be poisoned. Great care must be taken not to let poisoned grain get in the way of children, domesticated animals, or native birds. This is not difficult if it is carefully watched during time of exposure. One of the best means of keeping the sparrows in check is by destroying their nests. This may be done by everyone wherever the birds build, and if carried on in a systematic way will help much to keep the English sparrows within bounds.

Seven states legislate against the English sparrow. Of these, four simply except it from the protection afforded other birds. New York

makes it a misdemeanor to harbor or protect them; while Michigan pays a bounty of three cents for each sparrow's head. Over twenty of the remaining states give the English sparrow the same protection that is offered to other birds. The remaining states have no laws on the subject.

The first thing that should be done to check the sparrows' increase is the repeal of all laws offering them protection. Doubtless many who would turn their hand against the sparrow are prevented from doing so by bird laws. As recommended by Mr. Barrows, it may be best that one able man should be employed in every town and city to superintend a systematic warfare against the English sparrow. No matter how much farmers and gardeners desire to destroy these birds, it will be of comparatively little avail so long as the sparrows are permitted to stay in their great breeding haunts—the cities—unmolested. The alarming rate at which the sparrows have increased during the past few years, shows only too clearly that some action is necessary. No doubt a bounty helps to lessen their numbers; but it is a question if this is the best way to exterminate the English sparrow. This method has been employed in Michigan since 1887, and has been found an expensive method of lessening their number. The greatest objection—that other species of birds are killed by careless persons for English sparrows—would apply as well to any other means of destruction. The scheme for offering liberal prizes for the greatest number of birds killed in any given territory is worth considering. If the prizes are sufficiently large many persons will compete, and great destruction to the sparrows would result. Whatever means are employed, it is of the greatest importance that all states and territories infested be united in their efforts, and all employ some good means of eradication. One or two states alone can accomplish but little, as the sparrows are spreading so rapidly that the birds would migrate from other states near by as fast as those within the state limits were destroyed.

No one should receive sparrows on a bounty or prize that has not thoroughly studied the bird. Far too many of the town clerks in Michigan do not know the English sparrow's head from that of a linnet or thrush. As a result, a great many birds that have been sent in for a bounty are our most beneficial birds. Thus many heads have been sent to this station, on which a bounty was claimed, of such valuable birds as the song sparrow, red-pollled linnet, and evening grosbeak; birds that our laws protect by a fine of \$5.00 against their slaughter. We have a good law against destroying native birds, and every person presenting such a bird to the town clerk's office should pay the penalty, which is a fine of \$5.00. During the past few months a number of letters have been received at the station asking for information on the subject. The following is a sample received from Midland county:

INGERSOLL, April 7, 1890.

The Republican of March 27, 1890, states that sparrow bounty orders have been issued by the county clerks from July 10, 1889, to March 26, 1890, for 15,697 sparrow heads. This calls for \$470.91. The most of these birds were killed in the fields; they are about one half as large as the English sparrow, and sing and fly like yellow birds.

E. W. PHETTEPLACE.

Most of these birds were red polled linnets, several heads of which have been received by us from Saginaw county, where they were offered for bounty. The bounty in this case is \$5.00 for each bird killed, to the state, from him who kills the birds.

It goes without saying that each town clerk should be instructed so that he shall know these birds when he once sees them. This bulletin will furnish this instruction. The law should be so amended as to make it his duty to inform himself, to make it a serious offense for him to pay the bounty for other birds' heads than those of English sparrows, and also make it his duty to collect the fine in case the heads of other birds are presented for bounty. The law does well to protect such valuable birds as the song sparrow and red poll. To slaughter them, as has been done the past year, is a serious wrong; to get pay for so doing is absurd. It is quite probable that the destruction of the birds will have to be limited to the winter season, when there is no excuse for mistakes. In summer, destruction of nests and eggs may be systematically carried on, and in cities could be very easily and profitably done under city regulation. The next legislation should, and doubtless will, thoroughly amend the English sparrow bounty act.

It is hoped that the descriptions and illustrations of this bulletin will enable any town clerk to identify the birds. Should any clerk be in doubt he could send the heads to this station, when he would be informed of the truth in the matter. It is greatly to be hoped that this bulletin will stay the terrible slaughter of our useful birds, which without doubt has been very common and wide spread all through the state.

C. B. COOK,

April 24, 1890.

PROCEEDINGS
OF
KINDRED SOCIETIES,
STATE, DISTRICT, AND COUNTY,
IN
MICHIGAN.

FOURTH ANNUAL MEETING

OF THE

MICHIGAN MANUFACTURERS OF FRUIT GOODS,

HELD IN LANSING, JAN. 21 AND 22, 1891.

The fourth annual meeting of the Michigan Manufacturers of Fruit Goods was held in the council rooms in the city of Lansing on the 21st and 22d of January, 1891.

The meeting was called to order at 10:45 A. M., by L. S. FOSTER, vice-president, in the absence of the president, who arrived toward the close of the morning session. There was a very good attendance at the opening session, when the most of those present came forward and renewed their membership for another year.

After a few preliminary remarks by those present, the meeting adjourned for dinner.

Afternoon Session.

The meeting was called to order by the president, G. F. ALLMENDINGER, when the minutes of the last meeting were read and approved.

The committee appointed at our last meeting to draft by-laws for the governing of this association, made the following report:

CONSTITUTION.

WHEREAS, It is the duty of every man engaged in business to encourage his trade, and protect it in such a way that it may yield to him a fair share of profit; and whereas, the interest of every branch of business may be best promoted and protected by a union of effort on the part of those engaged in it, therefore, we, the cider and cider vinegar makers and manufacturers of fruit products and sorghum, of Michigan, believing that such an organization will prove beneficial, hereby unite ourselves in an association, to be governed by the following constitution and by-laws.

ARTICLE I.—NAME.

This organization shall be known as the Michigan Manufacturers of Fruit Products and Sorghum.

ARTICLE II.—OBJECT.

The object of this association is to cultivate a more intimate and friendly relation among the cider and cider vinegar makers and the manufacturers of fruit products and sorghum, of Michigan, and to promote in every expedient and lawful manner the interest of their business.

ARTICLE III.—OFFICERS.

The officers of this association shall be a president, vice-president, secretary and treasurer, and an executive committee of five members. These officers shall be elected by ballot at the regular annual meeting, and shall serve for one year, or until their successors are elected and qualified.

ARTICLE IV.—MEMBERSHIP.

Any person, firm, or corporation directly engaged in the manufacture of cider, cider vinegar, fruit products or sorghum, in the state of Michigan, can become a member of this association by applying to the secretary and paying \$1.50 and agreeing to abide by the constitution and by-laws and rules and regulations of the association.

ARTICLE V.—BY-LAWS AND RULES AND REGULATIONS.

Such by-laws and rules and regulations as are not inconsistent herewith shall be adopted for the management and control of this association as may be found necessary.

ARTICLE VI.—AMENDMENTS.

This constitution may be amended by a two-thirds vote of the members present at any regular meeting, or at any special meeting called for that purpose, previous notice of the intention to amend having been given to all members.

BY-LAWS.

ARTICLE I.—DUTIES OF OFFICERS.

SECTION 1. The president shall preside at all meetings of the association, and shall be *ex officio* chairman of the executive committee.

SEC. 2. The vice-president shall, in the absence of the president, preside and perform all such duties as devolve upon the president.

SEC. 2. The offices of secretary and treasurer may be held by one person. The secretary shall faithfully record and preserve the minutes and all other papers of the association; shall attend to the correspondence and collect all dues and assessments and pay them over to the treasurer, and attend to all the other duties pertaining to his office. He shall be *ex*

officio a member and secretary of the executive committee, and in the absence of special instructions given at any regular or special meeting of the association he shall be under the direction of that committee.

SEC. 4. The treasurer shall have charge of all money of the association, faithfully accounting for the same. He shall annually, at each regular meeting, or oftener if called upon, make a detailed exhibit of the state of the finances.

ARTICLE II.—MEETINGS.

SECTION 1. The regular annual meeting of this association shall be held in January of each year. The date and place for holding the regular annual meeting shall be fixed by the association at the preceding annual meeting; or the executive committee may by resolution be instructed to fix the date and place.

SEC. 2. Special meetings shall be called by the president at the written request of ten members. The place for holding the same shall be designated by him. The executive committee shall have the power to call a special meeting at any time and shall designate the place for holding the same.

SEC. 3. Twelve members of the association shall constitute a quorum for the transaction of business. Not less than thirty days' notice shall be given by the secretary, to all members, at any regular or special meeting.

ARTICLE III.—EXECUTIVE COMMITTEE.

SECTION 1. The association shall annually, after the election of officers, select five members who, with the president and secretary, shall constitute the executive committee for that year, any three of whom shall constitute a quorum to do business.

SEC. 2. It shall be the duty of this committee, in addition to carrying out the special instructions of the association, to exercise a general supervision over its affairs during the interval between meetings. It is empowered to represent the association during such interval and shall have full authority, in the absence of special instructions, to direct the secretary in the discharge of his duties, in all cases that may arise which are not directly provided for in these by-laws.

ARTICLE IV.—VOTING.

SECTION 1. Each member shall be entitled to one vote on all questions.

ARTICLE V.—ANNUAL DUES.

SECTION 1. The annual dues for membership, as provided in Article IV. of the Constitution, shall be due and payable at the annual meeting.

ARTICLE VI.—MEMBERSHIP.

SECTION 1. Any person, firm, or corporation eligible to membership in this association, can become a member by making application to the secretary and paying the annual dues and subscribing, or authorizing the

secretary to subscribe for him, to the constitution and by-laws, and agreeing to abide by the rules and regulations of the association.

ARTICLE VII.—AMENDMENTS.

SECTION I. These by-laws may be altered or amended at any regular or special meeting, by a majority of the members present.

A motion was made and carried that the report of the committee on by-laws be accepted.

An amendment was then offered, that the members be allowed to make an exhibition of their products at our meetings. Amendment adopted.

Next in order came the report of the committee on legislation, who reported that they had succeeded in doing but very little in the matter of legislation.

A paper was then read by Samuel McFetridge, upon the subject,

SORGHUM MILLS AND THE MANUFACTURE OF SORGHUM.

It is very safe to assert that no plant grown in this higher latitude has received so much attention, during the last twenty-five years or more, as has the sorghum, or northern cane plant. Its advent among us at a time when our sugar supplies were cut off from our southern fields by the hand of war, and prior to the development of the sugar beet of Europe, was hailed with delight and surprise somewhat akin to that of the little Monitor in her morning drill with the Merrimac in the waters of Chesapeake bay. But it was found, while the plant produced beautiful crops of cane, and it seemed to thrive in any section where the Indian corn would grow, that after running the cane through rollers hastily made of wood, and boiling the juice in open iron kettles, an article of molasses was produced which, to many, was quite unpalatable because of its greenish, acidulous flavor. But what was to be done? Should we cast it aside as useless? or should we exercise that skill and patience, and call into exercise that inventive genius which has characterized every boon of importance which we enjoy today? Prudence and economy answered in the affirmative.

If the baker wished to furnish his customers with the best article of bread, he would not expect to accomplish his object with an inferior wheat, simply pounded in a mortar and mixed with water. No; nor even yet would he expect to succeed by the aid of a few of the latest methods of operation. If you were to confine him to these he would shrink from the task in hopeless despair. He would say: if I am to succeed in satisfying the average palate of this day and age, you must allow me the use of good wheat, the latest methods of making flour, the best methods of preparing the dough, and last, but not least, an oven heated to a proper degree. Then, by skill in the use of these, he would expect to succeed. And that which is true of the baker is also necessary with him who would prepare products from sorghum. But why need I longer speculate, as though I were dealing with an experiment?

Sorghum manufacture has passed this dangerous era of experiment and has now become one of the recognized industries of this country. The wooden rollers of early days have given place to ones of finest workmanship, of iron and steel, the old open iron kettle to the evaporator, made upon scientific principles, and the harsh fire heat used in boiling, to that

of steam, which gives us heat more intense, yet mellow in its effects, and under the complete control of the operator.

The subject given me will not admit us into the cane field to inquire as to condition of soil, variety of cane, manner of culture, etc. These are factors of immense importance. Indeed, of as great moment as the selection of variety and class of wood in the make-up of a good wagon. But presuppose these conditions to have been observed with care, the cane ripened to its proper stage, well bladed, topped, tied into bundles, with at least one band, and delivered at the mill.

The buildings and sheds need not necessarily be expensive, but should be sufficient to protect men and machinery from storm and the boilers from wind. There are two methods by which the canes are compelled to yield their saccharine matter. That which was first and is still commonly practiced, is by the milling process, or passing the cane through heavy iron rolls. The other or later plan, was taken from the beet sugar method of extracting sweet from sliced beets, commonly called the diffusion process. Each of these plans has its advantages as well as defects, and as the latter system has not been so simplified as to be applicable for small operators, we will not attempt a minute description of it in this paper; but simply say the cane is cut into pieces from $\frac{1}{4}$ to $\frac{1}{2}$ inch in length, dropped through a blast of wind, which carries away the green blade which encircles the stalks, and passed into cells. These cells or boxes are filled with warm water. After standing a time, this water is drawn into a second cell, which has been filled with fresh chips, and cell No. 1 is again filled with fresh water. Thus, after a system of ten cells have been treated in this manner, the chips in cell No. 1 are found to be robbed of nearly every vestige of sweetness. While a greater percentage of sweetness is obtained by this method, an additional expense is incurred in the evaporation of the added water.

Leaving this mode of extracting the sweet from the cane, for the present, we will introduce the older or better-known plan, that of squeezing or milling. As the mill is an important factor in obtaining satisfactory results, care should be taken to secure one of abundant strength and capacity for the work which will be required of it. There are a number of houses in this country, especially in Buffalo, Cincinnati, St. Louis, and Janesville, Wis., which turn out very good mills. The best of these single mills, while extracting quite all of the juice, will yet leave from ten to forty per cent. of the saccharine matter in the refuse. This waste may be somewhat lessened by the addition of a second series of rolls, placed a few feet from the first, and as the refuse leaves the first set, applying a spray of water which will aid materially in washing out the sweet as it passes through this second set of rolls, which otherwise would be lost. The juice, after leaving the mill, passes through a sieve or strainer into a cistern near by, from whence it is pumped to a convenient height in the evaporating rooms, where it is ready to pass through the process of conversion into syrup.

An analysis of this cane sap discovers to us some features which, if allowed to remain without treatment during this operation, will be quite ruinous. We will not attempt to define these difficulties, but simply recommend the course which has produced satisfactory results.

Two or more boxes are prepared called defecators, into one of which is drawn a quantity of juice to which is added a sufficient quantity of cream of lime to neutralize the acids which exist in the juice, some requiring

more and some less, the amount to be determined by the use of litmus paper in the case of the beginner, and by the smell arising therefrom by the skilled operator.

Steam heat from a boiler at 80 to 100 lbs. pressure is the best agent to perform the work of separation and evaporation. After the lime has been thoroughly worked through the sap, bring to a boiling point and hold until the blanket of scum is well removed, repeating the operation of turning on and off the heat and removing any refuse which may arise, until the body is entirely free from scum. Then add a bleacher in the form of water charged with sulphuric acid gas. The amount required may be determined again by litmus paper, but more easily in either case by experience. A little boiling should be done in the defecator, after which turn off the heat and let the sap settle, when it is ready to be drawn into the evaporator. Meanwhile the other boxes or defecators are placed at work in like manner, so that their alternate charges may give steady work to the evaporator. The evaporation should be done upon the moving or running plan—a continued inlet of clarified juice running through the evaporator toward the inlet of live steam. A thermometer placed near the outlet indicates the density at which it should be allowed to leave the evaporator. Care should be observed at this point, that the syrup be quickly and sufficiently cooled before allowed to collect in a large body. If this caution is not observed, the work which may have been well done to this point may be permanently injured by scorching. A good plan to accomplish the cooling is the running of the syrup through a tin pipe, say three or five feet long, inclosed in a larger one, through which a small stream of cold water is admitted at one end, and discharged at the other.

Syrup produced after this plan is giving good satisfaction wherever introduced, leaving corn and glucose goods far in the shade, and furnishes an article of sweetening which not only takes the place of New Orleans molasses for baking, but is being quite generally used as a table syrup.

As a sugar producer we do not claim for sorghum as yet that place which a few years ago was so fondly hoped it would soon occupy. Not that crystalizable qualities do not exist, but that a plan of operation has not been introduced or invented which will compete with the cheap labor of the sugar plantations; but instead of being discouraged by this feature we find a demand for this article of molasses that will give employment to large numbers of our people and diversify our productions, causing us to be more independent and furnishing the markets with an article of food both pure and healthful.

A general discussion was then entered into by H. B. GEORGE of Coldwater, W. H. YATES of Rochester, WM. A. HERRING of Jonesville, and others, who nearly all stated that in the raising of the cane the seed should be planted upon light sandy or gravelly soil and that there should not be any coarse manure used on the land, as it would give the molasses a strong taste and it would be of a darker color. Mr. YATES thought that the cane should lie at least two weeks after being cut before being ground, and that he thought it best to stand up in a covered building in bunches so that he could get around between them and thus work up any that might not be keeping as well as other piles.

Mr. McFETRIDGE recommended that the cane be left at least ten days before being ground and that he thought the better way to keep it was by piling it up on the ground, so that the air could freely pass through it and

thus prevent it from moulding and souring. He also stated that he did not care how long it laid if it did not freeze nor sour.

The topic "Our orchards, their enemies and method of meeting them," was very ably discussed by Professor A. J. Cook of the Agricultural college. Among his remarks he stated that the great trouble with nearly all farmers was that they did not take proper care of their orchards and that they do not manure and work among the trees as much as they should; that if they would take the proper care of their orchards they would realize a good profit from the same as well as from any other crop. Professor Cook related one instance where a man paid off a mortgage of three thousand dollars from the proceeds from one crop of fruit. Among the enemies that the orchardist has to contend with, he stated that in his opinion the worst were the mice and rabbits; second, rigorous climate; third, fungus troubles; fourth, insects and neglect. For the first he recommended treading the snow tightly about the trees or wrapping something around the trunks of the same. As a spray for the fungi he recommended what is called the Bordeaux mixture, which is prepared by dissolving six pounds sulphate of copper in sixteen gallons of water, by heating if necessary, also four pounds of unslaked lime in six gallons of water, mix the two together and apply to the trees. For spraying plum trees to prevent black-knot he recommended three ounces of the above mixture in one quart of water, and also about one quart of ammonia. For the destroying of insects, the arsenites are the only successful remedy. Prof. Cook stated that the proper time to spray fruit trees to destroy the insects was just after the blossoms had all fallen to the ground, and that in his opinion it was necessary to spray but once to make it effective. In setting out young trees, he recommended the using of soft soap to rub the trees with, and it would be well to use a little carbolic acid at the same time. This should be done the first week in June and again in about three weeks.

Motion made and carried, that a vote of thanks be given Prof. Cook, for his very able and complete remarks upon the subject.

On motion, the matter of the time and place of holding our next meeting was then taken up, when, on motion of Mr. HAMPTON, it was decided that when we adjourn it be to meet at Toledo, Ohio, at the same time and place as the meeting of the Ohio State Cider Makers' association.

The president appointed Messrs H. W. DAVIS of Lapeer, C. H. GODFREY of Benton Harbor, and WM. WHALEY of Milan, as a committee on samples. On motion, a committee of three was appointed, consisting of Messrs. A. TUCKER of Ann Arbor, WM. A. HERRING of Jonesville, and H. B. GEORGE of Coldwater, to investigate and report if we can get the proceedings of our meeting published along with these of the Michigan State Horticultural society.

Motion was made and carried that we proceed to the election of officers for the ensuing year. The president appointed JOHN CORTRIGHT and SAMUEL McFETRIDGE as tellers.

G. F. ALLMENDINGER of Ann Arbor was duly elected president for the ensuing year.

A motion was made and carried, that the secretary cast the vote of the society for H. B. GEORGE for vice-president. Mr. GEORGE was declared duly elected.

A motion was made and carried, that the secretary cast the vote of the society for SAMUEL McFETRIDGE of Ida for secretary and treasurer. Mr.

McFETRIDGE was declared duly elected secretary and treasurer for the ensuing year.

A motion was made and carried, that the secretary cast the society's vote for the following named gentlemen as a board of directors, viz: H. O. KELLY of St. Louis, PORTER A. WRIGHT of Davisburg, C. H. GODFREY of Benton Harbor, J. H. BARR of Saline, and A. W. STRONG of Ionia. The above members were declared duly elected for the ensuing year.

A motion was made and carried, that we rescind the vote whereby we voted to meet at Toledo for our next meeting.

A motion was made and carried, that our next meeting be held at Lansing.

On motion, the meeting adjourned until 7 o'clock P. M.

Evening Session.

The meeting was called to order by L. S. FOSTER, vice-president, when C. F. ALLMENDINGER read a very able paper on the subject,

FOOD ADULTERATION.

The members of this association are especially interested in the subject of food adulteration because some of the leading products manufactured by them, notably cider vinegar, fruit jellies, and canned fruits, are imitated and counterfeited by other manufacturers who place the spurious products on the market and proceed to sell them as genuine. Some of the substitutes are injurious to the health of the consumer, but the larger number of them are probably not unwholesome. A fraud is, however, perpetrated upon all users of such compounds. They are put upon the market simply to give some one an unearned profit. It may take place to pile up millions for an ARMOUR, by the sale of oleomargarine, or to enrich others from the sale of other concoctions purporting to be what they are not. Let it be noted that adulteration cheapens cost, always. An adulteration which increased the cost of manufacture has never been heard of.

Adulterations come into competition with genuine goods on every hand and in many branches of manufacture have driven makers of genuine goods from the market or forced them also to engage in making counterfeits. Back of these stand the agriculturists, who have no such resource, whose profits are also lessened in many directions. And back of all is the consumer, who even if he secures an article not injurious to health, does not secure as nutritious and wholesome an one as he should. He does not get the worth of his money nor does he get what he pays for.

The writer has taken up the subject in a general way, not confining himself to adulterations of goods in our line of manufacture alone. If we could get every citizen who is being imposed upon and defrauded of his money, aroused on this subject, the legislation we ask for would soon be upon the statute book; and for one, the writer proposes to keep at this matter until, through some agency, that legislation shall be included among the laws of the state of Michigan.

Says the special agent of the U. S. government: "The people have no

idea of the extent to which this damaging imposition is practiced; from the cheapest and most simple articles of diet, to the most expensive, the art of the manipulator has been applied. Every article of food is to a greater or less extent the subject of adulteration." And again he writes, "In the course of this investigation I have visited Boston, New York, Philadelphia, and Baltimore, and have met with a number of gentlemen who promptly responded to my request for information and were quite ready to aid in so important a work as the exposure of the frauds perpetrated against the health and commerce of the country. By correspondence and in personal interviews, I have failed to find a single uninterested person who has not added testimony as to the extent of adulterations." Such unanimity of sentiment, added to the able and voluminous reports of the officers of those states which have undertaken to suppress the nefarious practice, proves beyond question: (1) That adulterations exist to an extent that threatens every form of food supply; (2) that while they are mainly commercial frauds, practiced by unscrupulous manufacturers, manipulators, and dealers, for the purpose of deceiving their customers and adding to their gains, yet there are also, to an alarming extent, adulterations that have, in many cases, not only impaired the health of the consumer, but frequently caused death.

In the New York report for 1887, it is stated that of 376 articles of diet in daily use 255, or more than two thirds, were adulterated. Such figures testify to the prevalence of adulteration. Less than one third of the ordinary articles of diet are exempt. We might follow the method of some of the stump orators of the last campaign and state an extreme case: For our breakfast we are given adulterated coffee, into which we may turn adulterated milk, and then sweeten with sugar adulterated with glucose; we eat biscuit that have been raised with an alum baking-powder and spread it with butter that has been churned out of the fat of a steer instead of cream from a cow.

In the large cities there is known a "bologna sausage color," composed in part of saltpeter, alum, and venetian red, used to deceive the purchaser into buying stale, decomposed, or tainted meats, which he will have for dinner. He may also have pickles put up in adulterated vinegar and colored with salts of copper, and canned goods seasoned with lead. He will close the day by taking a cup of adulterated tea. The course is kept up until some day a doctor's services are in requisition. The doctor possibly discovers, after the death of his patient, that the drugs used were so adulterated that his efforts to stay disease have all been thwarted.

It is scarcely worth while to prove the prevalence of adulteration. Everyone is aware of the fact, and all close observers know that, large as is its extent, it is constantly on the increase. Yet a few figures place the matter before us in a startling light. "The total value of the food supply of the United States," according to the *American Grocer*, "is, at a low estimate, \$4,500,000,000 yearly. Dr. Abbott of Massachusetts estimates that those states that have attempted to protect their citizens against this crime of adulteration have saved those citizens five per cent. of the total amount used. At this rate, were the same plans carried out for the whole country, the saving would be the immense sum of \$225,000,000." Says the special agent of the agricultural department, concerning this estimate: "There is undoubtedly a large part of the food products that never leaves the hand of the producer, and, of course, this is not adulterated. And again, there are many articles manipulated and sold by honest men who

would disdain to sell their goods if debased or misbranded. Yet, in spite of all this, undoubtedly the percentage of adulteration, sophistication, and misbranding largely exceeds, in my opinion, five per cent. of the whole, and I am confident that fifteen per cent. would be much nearer the mark. Such an estimate would give the startling figures of loss to the people of this country alone of \$675,000,000 per year.

Michigan has about one in thirty-one of the population of the country. If her share of the loss is in proportion it amounts to more than \$21,774,000 per year.

What shall be done about the matter? The advice of the writer is to push ahead just as we have done; to unite with all bodies who are in sympathy with us, like the State Dairymen's association, agitate the matter in every possible manner, through the press, through organized local societies, and in any way which offers opportunity. We must take a broader view than merely to secure the enforcement of a vinegar law. And the U. S. laws are not enough. Respecting oleomargarine, they are but half enforced. In Detroit, vigilance is maintained until the tax is paid, after which, in many cases, the product is still retailed for butter, and in the pine woods and in the northern peninsula it is undoubtedly done to the extent of hundreds of thousands of pounds yearly.

We have to contend with a cry for fewer officers. It would be folly for us, therefore, to ask for vinegar inspectors, and for the dairymen to ask for state inspection of butter and dairy products, when one set of officers could well attend to both matters and to the inspection of scores of other foods which are subject to adulteration.

There are laws in the Minnesota and Ohio statutes which fully cover our needs. The workings, both of the laws and the commissions, are not experimental at this stage. Any of our legislators who are interested will have no difficulty in gaining information, and to such the bulletins of the Agricultural department at Washington and of the commissioners for Minnesota, Iowa, Ohio, New York, New Jersey, Massachusetts, and of other states will furnish instructive as well as entertaining reading. The work of these commissions lies largely, and perhaps principally, in making analyses and publishing them. People are not knowingly humbugged to any great extent. In Ohio the sale of a beverage known as "orange cider" at one time reached large proportions. Upon analysis it proved "sweetened water, sharpened up with citric and tartaric acid and flavored with the oil or extract of orange." The cost was about 16 cents. It was retailed at \$2.50 per gallon. In ten days after the fraud had been published, the whole business collapsed.

The chemist of the Minnesota commission analyzed many samples of vinegar made by the firm of Schuyler & Cook of Chicago and published his results. The following from the Chicago News tells the story of the power of such a commission: "We regret to make announcement of the assignment of Schuyler & Cook, one of the oldest and best established vinegar firms of the city. The leading grocers of Chicago and the northwest have handled their goods and advertised them as being free from adulteration. The best hotels of the city have also been customers of the house. About one year ago the Minnesota legislature passed a bill designed to prevent the adulteration of food in that state. One of the chemists of the food commission made analyses of different samples of vinegar of Schuyler & Cook's manufacture, and reported that they did not come up to the Minnesota standard, hence they could not be sold as

pure vinegar. This practically shut Schuyler & Cook out of their best market and was one of the causes of their failure. The affairs of the company are now in the hands of a receiver."

These two cases are cited to show the power of a food commission. Sales of spurious goods are cut off by simply informing the public of what ingredients they are composed. Expensive litigation is unnecessary and a small appropriation may be made to cover a great amount of work.

We ask to have done only what has in recent times been proved necessary in European countries as well as in our own. Legislation on this subject has in recent years been demanded and given in Great Britain, in Holland, in Germany, and in France, severely punishing adulterations of foods, drinks, and medicines.

It is unwise to set up a shout of "no more officers," regardless of the ever-increasing needs of a growing community. We want new officers if there is work for them to do. We are willing to be taxed if the money is used wisely, as it must be in this case.

The practice of adulteration is increasing, and our neighboring states, by establishing commissions, are narrowing the territory in which they may be sold. Michigan is therefore becoming more and more a dumping ground for poor supplies, a statement we know to be substantiated by facts, and which is not flattering to our state pride.

The cost in Ohio has been as low as \$6,000 per year, including chemists' expenses. The people of that state have saved that cost many times, enjoying in addition a purer food supply, the value of which cannot be estimated in dollars and cents. We say to the members of our state legislature:

Gentlemen, Michigan is using adulterated foods costing more than \$20,000,000 yearly. Is it worth while to cut this short by an outlay of a few thousands? Would it not prove the most profitable investment the state of Michigan ever made? Is it worth your while to investigate this matter?

The next topic was "National and State Legislation," which was very ably handled by O. S. MILLER of Holly, New York, who proceeded to give a history of the vinegar law in the state of New York, how it was secured and also how it was enforced. Remarks were also made by WM. A. HERING, G. F. ALLMENDINGER, A. TUCKER, C. H. GODFREY, and others.

On motion of A. TUCKER, a committee was appointed to go before the legislature and look after the framing of a bill for the appointment of a food commissioner for the state of Michigan, consisting of G. F. ALLMENDINGER, H. B. DAVIS, and C. H. GODFREY.

On motion, the meeting adjourned to meet tomorrow morning at 8:30 o'clock A. M.

Thursday Morning's Session.

The meeting was called to order by the secretary, in the absence of both the president and vice-president, when C. G. HAMPTON was given an opportunity to show his company's machinery, which he did in a very few words.

The topic, "The Model Merchant Mill," was then taken up by Wm. A. HERRING, who proceeded to give his ideas of a merchant mill, which he did very ably by the use of several diagrams and illustrations. The subject was then discussed by several members for a short time.

A paper on "Vinegar and its Manufacture" was next read by E. L. PRUSSING of Chicago.

VINEGAR AND ITS MANUFACTURE.

Mr. Chairman and Gentlemen:

"Vinegar and its Manufacture" has been assigned to me to give what light I can on the subject. It is, however, of so wide a scope that, even were I able to do it full justice, its length would worry you, so I will try to confine myself to its general principles as applied to our needs, and will refrain from quotations of chemical works, nor yet follow the methods of some of our illustrious men by repeating extracts from the encyclopædias. Should I adopt either of these two courses I could give you a much abler treatise on the subject, and one that would read quite learnedly and well before a gathering of theorists; but I take it that this gathering is composed mainly of practical business men who, in addition to their interest and devotion to enhancing the superiority of their products, are, in the terse slang of the day, "out for the stuff." I will therefore refer only to questions of the present and give results as gleaned from twenty years' active experience, mainly learned from the tuition of my father, who devoted thirty-five years of his life to the vinegar business.

I shall dwell mainly on vinegar made of corn and that made of apples, since the manufacture of vinegar from wood, at which I served an apprenticeship in Germany, and that made of malt, of which the English boast, are both of so little importance in this country that they cut no figure. A so-called malt vinegar is made in this country but it is either artificially colored corn vinegar or made of molasses, which it is unnecessary to color artificially, therefore it comes within the pale of the present vinegar laws; but, like most crimes, "its own sin will find it out," and it can be left to its own fate.

Regarding the question of injurious or unwholesome vinegar, I stand upon a somewhat similar platform to that upon which stood the "crushed tragedian" who bought a penny cigar, saying, "there are no bad cigars but some cigars are better than others," and do not find it necessary, in order to sell my goods, to decry or villify those of my competitors, since I believe that goods which are superior in flavor, strength, clearness, and color will bring a correspondingly better price, and that our customers can be brought to learn the superiority of an article so that they will know when they get hold of a good thing and will not be so readily won away by the smooth tongue of the first angel of commerce who may happen along. This fact holds good in wines and beers; and, believe me, you will find it holding good in vinegar.

To more readily understand the subject under discussion, I will give a brief synopsis of the manufacture of vinegar from corn, believing that it is not good policy to underestimate the strength of "our friend, the enemy," since, knowing what we have to contend with, we shall be better prepared.

Corn or whisky vinegar is made from ground grain in the proportion of eighty bushels of corn meal, ten of malt, and ten of rye. When this grain

is properly mashed and heated, the diastase of the malt converts the starch of the corn into saccharine, and the rye, with the assistance of yeast, aiding the fermentation thereof into a beer, containing alcohol, which alcohol is separated from the beer by distillation, and the resulting vapor condensed by forcing into cold water. This product is called low wines, being whisky below proof, in contradistinction to high wines, or whisky above proof. From this low wines the vinegar is made, by means of the vinegar generator, of which I will speak more in detail later on, as generators can be employed also to advantage in making vinegar from apple juice.

The making of low wines containing twenty per cent. of alcohol, without the payment of any revenue tax whatever, is allowed only in vinegar factories by an act of congress passed March, 1879, commonly known as the "vaporizing law." It was one of those pieces of class legislation which interested parties sometimes manage to get our law-makers to think the country is suffering for. My father and myself, along with a few others, spent the greater part of that winter in Washington opposing the passage of that bill, but without success. The enactment of this piece of class legislation, as was foreseen, is the source from which all the troubles of the cider-maker arise, as it enables vinegar made from grain at a cost of two and one half to three cents per gallon, to be colored with burnt sugar, and by branding the packages with fancy label or stencil, to palm it off on an unsuspecting public as pure cider or fruit goods. The trade generally are forced by competition to handle this article, and vinegar manufacturers are compelled by the same means to fall into line with the new methods or retire from business, in consequence of which vinegar dealers are learning to believe in P. T. Barnum's maxim, that "the American people like to be humbugged." The vinegar itself is pure and wholesome enough (so is oleomargarine for that matter) but the selling of it under these false representations is nothing more nor less than a fraud, when done outside of those states having vinegar laws, while within their boundaries it becomes a crime as well. If any of this company were to go into a jewelry store and, on the representations of the dealer, pay the price of a genuine gold and diamond ring, and then learn in a few days that it was simply brass and paste, how quickly he would consider he had been swindled and set the police authorities on the swindler's track. Yet brass and paste are harmless and useful articles in themselves, and if taken at their true value answer the purposes of some people; but if we are quick to guard our purses, how much more essential it becomes when we can protect our stomachs as well. A law was passed and approved in this state, July 1, 1889, making the selling of any vinegar other than that made wholly from cider or fruit, as pure cider or fruit vinegar, or of artificially coloring vinegar, a crime punishable by fine and imprisonment. This law has been upon our statute books for over a year and a half now, and is plain and ample to punish misdoers, but there never has been a prosecution or conviction under it, though there isn't a prosecuting attorney in the state, nor yet a plain ordinary citizen, who can not go before the proper court of his country and secure the conviction and punishment of any wholesale or retail dealer or manufacturer who transgresses the law, with the same ease that he might secure the punishment of a swindler or thief who breaks any other law of the state. But what is everybody's business generally proves nobody's business, and the law will remain a dead letter until a food commissioner is appointed in the state

and its enforcement made obligatory upon the state board of health, as is done in Indiana, or some other means adopted to see that it is respected.

A few months' energetic work by any competent man would secure the coöperation, or failing that, the conviction, of enough dealers to drive every barrel of spurious cider vinegar out of the state of Michigan. Happily some of the other states of the Union, mainly in the east, but Ohio, Indiana, Wisconsin, and Minnesota in the west, have satisfactory vinegar laws and commissioners to see that they are enforced, with the results that cider interests have taken great strides in advance during the past few years, and apple-growers and cider-makers are correspondingly better satisfied with the world's justice. It remains for Michigan, the second apple state in the Union, to be shown by Minnesota, which has no apple interests, where only common honesty demands this reform; and I believe that the honorable representatives of this state require only to have their attention called to this injustice to the people and injury to a great interest, to take the proper steps to change it at once.

To that end it behooves every man who has an apple tree in his back yard, as well as every cider-maker in the state, to labor with the representative from his district and point out the road that leads to salvation. A unanimous effort in this direction this winter will accomplish the result that simple fairness demands, while the growing and future crops of cider and cider vinegar will be enhanced in value some 50 per cent.

My strong feeling upon this matter must be my excuse for referring to it at such length here, and I shall now return to the mode of vinegar manufacture.

The vinegar generator, as heretofore mentioned, can be used equally to advantage in making cider vinegar as well as low-wine goods. It is an upright tank or tub filled with curled beech or maple shavings made expressly for this purpose and through which the air circulates by entering one or more air holes about six inches from the bottom and escaping through a perforated cover or false top placed inside about six inches from the top. Great care is necessary to regulate the circulation of the air, which can be done by means of the air inlets, to the temperature and action of the generator, as the shavings are merely for the purpose of giving a wide surface and the exposure of the liquid to the action of the oxygen of the air which converts the alcohol into acetic acid, thereby heating the shavings with the danger that they may become too hot and so vitiate the oxygen in the air, creating aldehyde, and also cause the alcohol to evaporate, as alcohol evaporates at ninety degrees Fahrenheit. To bring a vinegar generator into working order requires much time and expense, and it must be given thereafter every day, including Sunday and holidays, the quantity of raw material it requires or can digest. It can not be overfed, neither can it be starved at any time, in fact, it is comparable in this respect to the human system. As long as it is given its regular rations and guarded against atmospheric or other changes, so long it will remain healthy and in good working condition; but insufficient or overfeeding is equally injurious and the manufacturer will have the same trouble bringing it around that a doctor frequently experiences with his patients.

It has been demonstrated to the satisfaction of most modern vinegar makers that the best size for a generator is about eight feet high by four and one half in diameter, though many claim superiority for those twice that height and a little wider.

The generating or quick process of making vinegar accomplishes in a

few hours what would otherwise require a few years, with the improvement of filtration through the shavings and the uniformity of the product; and is as far in advance of the older and self made method as the steam car is ahead of the stage coach.

When cider vinegar first comes from the generator, it apparently loses some of its fruit flavor, but this is only because it is new or fresh, for as it ages all this comes back and it acquires all that rich, full, fruit flavor that time alone can impart.

To cider-makers who may have an idea of working up their repressings or of adding a vinegar plant to their cider-mill, I would say quite emphatically, don't do it. Vinegar-making is a business requiring the constant care and attention of a competent man, and cider-makers will find that more money can be made, and much worry saved, by selling their vinegar stock to a properly equipped vinegar-maker who makes enough to justify its proper attention. By this means cider-makers can give their undivided attention to the mill during the apple season and can find more profitable employment elsewhere the balance of the year.

If it is thought local trade will take an output at satisfactory figures, then the finished vinegar can be bought of a manufacturer for two or three cents advance on what he pays you for your stock. This would be on the same principle that the farmer now sells his wheat and buys his flour.

When the vinegar comes from the generator, whether cider or low-wine goods, it is allowed to stand twenty-four hours or longer in the receiver or tank, filled with long, straight shavings or charcoal, in order to clarify or filter it. It is then drawn into barrels and is ready for market.

Cider vinegar makers must bear in mind that the better the quality of the cider used the better will be the vinegar. Choice, fine flavored vinegar can not be produced from rotten apples or second pressings, any more than a fine wine can be made from the skins and stems of the grape.

A vinegar can be made from these materials that is pure and wholesome enough, as the chemical changes of the raw material, first into alcohol and then into acetic acid, with the requisite filtration, leaves none of the putrefactive principle in it, but it is as far from having the rich, fruity flavor desired as corn vinegar itself.

On motion of O. S. MILLER, a vote of thanks was tendered Mr. PRUSSING for his very able effort, and a request made that he present so much of his paper as relates to legislation to the legislative committee, who will meet with us later in the session.

A motion was made and carried that we take up the paper that was assigned to the afternoon session.

Remarks were made by H. B. DAVIS, O. S. MILLER, Mr. NEALY, C. H. GODFREY, E. L. PRUSSING, and others.

The committee on printing reported that they had investigated the matter and thought that there would be no trouble in getting our proceedings published with the Horticultural Society's report.

On motion, it was voted that the secretary correspond with Mr. REID, secretary of the State Horticultural society, requesting that our proceedings may be published together with their report.

An amendment was offered and adopted that a request be sent for enough copies to supply each member of this association with a copy.

Mr. TUCKER was then given an opportunity to show the merits of his company's machinery, which he proceeded to do in a few words.

On motion, meeting adjourned until two o'clock P. M.

Afternoon Session.

The meeting was called to order by the president, when Mr. HERRING talked a few minutes on the merits of the machinery which he had for sale.

The committee on exhibits then made their report as follows:

Mr. President and Gentlemen of the Association:

Your committee to whom was referred the exhibits of fruit products, would respectfully report that we find from DORR, DAVIS & Co., of East Gilead, the following: Two samples of boiled cider, one sample of apple butter, one sample jelly, one sample home-made vinegar.

From the YATES Co. of Rochester, 4 samples jelly, 4 samples sorghum, one sample boiled cider.

From CORTRIGHT BROS. of Carlisle, half-gallon pail of jelly.

From J. T. WILLCOX of Flint, two samples of condensed mince-meat.

From W. H. OVERHOLT of Eden, samples of evaporated apples, black raspberries, red raspberries, plums, pears and pumpkin.

From the GENESEE FRUIT Co. of Rochester, New York, six bottles carbonated sweet cider, and one ten-gallon keg of sand-refined cider, also a sample of cider vinegar, showing three per cent. solids and 48 grains' strength.

We further find that all the above named exhibits were carefully made, of the highest quality, very attractive in appearance, and entitled to the thanks of this association.

H. W. DAVIS,
C. H. GODFREY,
WM. WHALEY,
Committee.

On motion, the report was adopted.

On motion, it was voted that the secretary be compensated for the labor in preparing the minutes of this convention for publication.

A motion was made and carried, that a copy of the vote of thanks be forwarded by the secretary to Professor A. J. COOK, for his very able address at our meeting yesterday.

On motion, a vote of thanks was tendered the members of the city council for allowing us the use of their council room in which to hold our meeting.

On motion, the secretary was authorized to settle with the janitor of the council room for his services in warming, lighting, and taking care of the same for our benefit.

A motion was made and carried, that when we adjourn it be to meet on the second Tuesday and Wednesday of January, 1892.

A motion was made and carried, that L. S. FOSTER be elected a committee to prepare an account of the New York State Cider Makers' association and report at our next meeting.

Following is a list of members:

C. J. JOHNSON & Co., 58 and 60 South Water St., Chicago, Ills.	W. H. OVERHOLT, Eden
E. L. PRUSSING, Chicago, Ills.	C. G. HAMPTON, 970 Woodward Ave., Detroit
GENESEE FRUIT Co., Lansing.	H. OSCAR KELLY, St. Louis.
C. B. CARR, Manchester.	URIAH BRILLHART, Sethton.
W. H. YATES & SON, Rochester.	OVID FRUIT DRIER, Ovid.
CORTRIGHT BROS., Carlisle.	WM. A. HERRING, Jonesville.
ANTHONY ARENS, Westphalia.	H. B. GEORGE, Coldwater.
SAMUEL McFETRIDGE, Ida.	E. E. EMMONS, St. Johns.
N. H. WESTON, Mayville.	SILAS KILBOURN & Co., Grand Haven.
A. W. STRONG, Ionia.	E. J. MASON, Grant.
B. L. HALL, Benton Harbor.	NEALEY & HUNTINGTON, Mason.
W. A. BARKER, Grand Ledge.	E. T. BUSH, Plainfield.
R. B. HOAG, Springport.	DORR BROS. & Co., East Gilead.
J. M. ROWLEY, Greenville.	O. S. MILLER, Holly, New York.
A. TUCKER, Ann Arbor.	J. H. BARR, Saline.
LEONARD BROS., Milan.	KINNEY & ROBINSON, Benton Harbor.
WM. WHALEY & SON, Milan.	DAVID KNIGHT, Sawyer.
G. F. ALLMENDINGER, Ann Arbor.	FRANK MORLACK, St. Joseph.
C. H. GODFREY, Benton Harbor.	J. S. WILCOX, Flint.
H. W. DAVIS, Lapeer.	J. C. SELBY, Eaton Rapids.

SECRETARY AND TREASURER'S REPORT.

Lansing, Mich., January 21, 1891.

Michigan Manufacturers of Fruit Goods, in account with PORTER A. WRIGHT.

	Dr.
Jan. 14, To printing 850 four-page circulars.....	\$6 25
printing 1,000 quarter-sheet folio.....	4 50
postage for mailing same.....	5 60
stationery, etc.....	60
cash paid janitor for services.....	2 00
Total.....	\$18 95
	Cr.
By cash received from Silas Kilbourn & Co.....	\$5 00
balance on hand last year.....	20 64
cash received from 40 members.....	60 00
	\$85 64
	18 95
Balance on hand.....	\$66 69

PROCEEDINGS
OF THE
WEST MICHIGAN FRUITGROWERS' SOCIETY.

1890.

RECORD OF THE JUNE MEETING,

Held in Shelby, June 24 and 25.

At the meeting of the West Michigan Fruitgrowers' society, at Shelby, Oceana county, the 24th and 25th of June, reports were made by orchardists from nearly all the counties of the lake shore, as to the condition of the fruit crop, showing it to be far below the average, except as to all the small fruits, these all yielding or promising abundantly.

The two sessions of the first day were very well attended, nearly all the lake shore counties being represented. A quantity of enormous strawberries was on exhibition, C. F. HALE and L. B. MITCHELL of Shelby showing Sharpless and J. W. HUMPHREY of South Haven had Sharpless and Jessie. It is hard to imagine more beautiful berries than the latter either as to form or color.

W. B. ANDRUSS of Allegan added to his wide repute as a grower of fine apples by an exhibit of Spy, Stark, Jonathan, Golden Russett, Baldwin, Rubicon, Wagener, Ben Davis, King, Fallawater, Ostend Greening, Red Canada, American Beauty, Cooper's Market, and Smith's Cider. All these were in a surprisingly good state of preservation.

Following the reports as to the fruit prospects, was a discussion of

"INSECT ENEMIES AND REMEDIES."

WALTER PHILLIPS: Buckwheat sown in June and plowed under when in blossom is fatal to all larvæ, that of the cut-worm included. I advise the plowing in of such a crop before setting any fruit trees or vines, to rid the ground of the cut-worm, which is so damaging to all young stock. I have tried carbolic acid spray for curculio, but without success. No plum-grower depends upon spray of any sort, but solely upon jarring. Spraying is effectual as we all know, for the codlin moth, but one or two ounces of London purple to fifty gallons of water are enough.

MR. MEISENHEIMER of Ludington had recently seen apple trees drying, the wood of this and the last year's growth drying up, having grown only an inch this season, Talman seeming to be the worst of all. The wood turns black. No one had seen the same or could suggest a remedy.

C. A. HAWLEY was sure that buckwheat is effectual against the codlin moth. He did not know at just what stage of growth he had plowed it under, but keeps it about and thinks its mere growth in the orchard sufficient.

WALTER PHILLIPS: Its potency is due to gases generated by decomposition of the bloom.

Mr. CHAPMAN of Bangor said there are several cut-worms which prey upon vegetation, and asked which one was meant; and was told, the grayish worm which attacks vegetables, not the black one which eats grass.

C. A. HAWLEY told how, some years ago, he and J. L. HOPKINS of South Haven set 4,000 peach trees near Shelby; but saved only 1,000. They tied cotton-batting about them, but it hardened after a rain and the worms crawled over it. Mr. HOPKINS said he was told at the time that there were no cut-worms in Shelby, yet they destroyed 150,000 trees for him in one place and 30,000 in another. "I don't know if there have been any since—I have not been here since." Mr. ADAMS said they had not troubled seriously since that year—1884; and no little merriment was made over the presumption that Mr. HOPKINS and cut-worms travel in company.

N. W. LEWIS: A neighbor has successfully combatted cut-worms by strewing clover poisoned with Paris green.

Mr. LANNIN, saying cut-worms are partial to clover, asked Mr. HAWLEY what was on the land, the year before, where the peach trees were killed; and was told that clover had been there two years, but the worms were no worse in that field than elsewhere, and were not so bad in the lower ground where there was clover also.

A. HAMILTON: Clean culture is not a remedy; for when cut-worms can find nothing else they will destroy even trees three or four years old. Mr. HOPKINS had known them to attack trees eight or nine years old.

Mr. PETTINGER: These cut-worms may be found in the woods, but not in new land because the burning kills them. There were divers opinions expressed as to clay and sand lands being equally subject to cut-worms' ravages, enough for all strenuous needs, at least, being certified as inhabiting both.

WALTER PHILLIPS recommended spraying grapes with Paris green or London purple, for the rose chafer, saying there is no danger, as the poison will be washed off by the rain before the fruit ripens.

Mr. LANNIN: A quantity sufficient to kill rose chafers will destroy the grapes.

Mr. PHILLIPS: Yet I sprayed, killed the rose chafers, and got a crop.

QUESTIONS IN VARIETY.

Turning from this to the question-box, its contents were disposed of in this order:

1. *Shall we cultivate as thoroughly and as late as usual in peach orchards that are not in bearing this season?*

Mr. MERRITT: I should say, that depends. If trees are as thrifty as usual, yes; but cultivation is not as necessary when there is no crop. To this Mr. BEEBE agreed. Mr. HAMILTON: Much depends upon the age of the trees. I would cultivate young trees as thoroughly but not as late.

2. *Why was that plum matter left without any discussion, I want to know?*

MR. LA FLEUR: Because we ran off into discussion of something else until the time was up.

3. *Which is better for peaches, heavy clay soil or light sandy soil?*

O. BEEBE: About half way is best. MR. MEISENHEIMER: Of the two, clay. MR. HOUK: I would rather have sandy soil, but medium is best. MR. ROBINSON: A sandy loam. MR. BROOKS: These do not answer. The question means what it says—the extreme either way. MR. LINDERMAN and MR. BEEBE preferred the sand. MR. MEISENHEIMER: It is useless to set Crawford's on very light sand. MR. HOUK: And to set any kind of peach on heavy clay. MR. HAMILTON: I would take the clay. "Sandy" is bad enough, but when you add "light" I want nothing to do with it.

4. *When is the best time to spray apples?*

H. H. PRATT: From the time the blossoms fall, on to the middle of June. Once spraying saved seven tenths of a crop for me. Six ounces of London purple to one hundred gallons of water—three ounces to a kerosene barrel—is the proportion I use. It burns worse than a long drouth.

5. *Should every fruitgrower here become a member of this society?*

No reply was made.

6. *Is there any remedy for rust on raspberries?*

MR. LA FLEUR: Just one—dig and burn.

7. *Has anyone present had experience with the Russian apricot? Is it desirable?*

C. H. DARROW, Geneva, N. Y., (representing HAMMOND & WILLARD, nurserymen): There is a large demand for it, but I have not had sufficient experience with the same to recommend it. MR. HAWLEY: Mine die out on low land but thrive well enough on elevations. MR. LA FLEUR: Several hundreds have been set in my vicinity. Those grafted on peach stock have not done well, though three years set. They blossomed this year very early, which may be a disadvantage. I think another year will tell.

8. *What is the best way to sell fruit?*

There was the usual talk, in response, of honest packing and sales at the orchard.

9. *What caused the apple, pear, and peach to drop, this season?*

Several residents of Oceana county believed this to be due to a hot, blighting wind which they said blew from the southeast, a few hours in the forenoon of June 5; yet one insisted it came from the northeast. MR. LANNIN disbelieved in all this, and argued that it was due to imperfect fertilization, this resulting from weakness of the trees from vicissitudes of the winter and spring. In this view O. BEEBE coincided, explaining the process of fertilization of blossoms and saying that three or four days of cold rain had on occasion ruined his grape crop by preventing pollination. Prof. A. L. REDDING of a Findlay, Ohio, college, with much energy repelled this idea, claiming there could be no development without fertilization, and it must have been the wind. Messrs. LAFLEUR and BEEBE insisted that there could be, and often is, development of the outer parts of fruits,

growth presently ceasing, however, when growth of the germ fails to follow through imperfect fertilization. But Oceana and Mason county growers would have it that 'twas the wind and nothing else, for the young fruits were well developed and healthy up to that moment.

10. *What causes the peach leaf to curl? Should the tree which has curl-leaf be cut back? Does spraying a tree soon after it blossoms prevent curl-leaf? What varieties of peach are most liable to curl-leaf? Is there any preventive to curl-leaf? Is anybody quite sure that Paris green or London purple will kill the rose bug? What varieties of peach are most liable to curl-leaf, blight, or falling off of the leaves?*

Replies to all these were, that cold winds or rains will cause curl-leaf on even the healthiest trees. Mr. PHILLIPS thought the condition of the sap had much to do with it. It is not necessary to cut back such trees, and spraying does not help them. Some thought there was, others thought there was not, any difference in varieties in this respect. The disease is quite prevalent this year, and upon all soils.

The village people were numerous at the Wednesday evening session, although the night was insufferably warm, conducting quite properly to a brief session.

A quartet rendered an anthem; Hon. D. C. OAKES, president of the village, made an address of welcome, in the usual style, to which President LANNIN and Messrs. N. W. LEWIS and E. C. REID responded.

HOW TO BUY NURSERY STOCK.

ALEXANDER HAMILTON of Ganges read the following paper:

"Where, when and how to prepare nursery stock" are questions easy to ask and not very hard to answer. If you know and can procure just what you want, it matters little, I think where it is obtained. As a rule, however, if you can not grow it yourself, I believe your purchases from home nurserymen or known dealers will prove the most satisfactory in the long run. The nursery stock furnished by the unknown, though gentlemanly-appearing and fascinating tree peddler, who has such nice pictures of what he calls his Russian apples, double-budded French pears, and iron-clad Siberian peaches, all frost and insect proof, has proved the least satisfactory in western Allegan county, where, in the earlier days of fruitgrowing, large quantities of this bogus stock were sold at prices no one would think of paying for good common nursery stock. Fall and spring are the only times when nursery stock can be procured. Our people, who have had the experience of a quarter of a century, buy nearly all their stock and get it home and heeled in in the fall. As to how nursery stock may be procured, I know of but two ways: buy it or grow it, and a little experience will satisfy you which is the better way to do.

A. C. MERRITT: I favor the home-grown tree whenever obtainable. I have the best success with trees of my own growing, lifted from the nursery row to their place in the orchard. Next to this I have done the best with stock grown near by, although I have bought much abroad.

M. H. HITCHCOCK of Ludington has bought in Michigan and New York, but prefers trees grown at home—somewhere on this lake shore; and had succeeded well with some of his own budding.

N. W. LEWIS: I am in accord with Mr. Hamilton, for he has stated facts. Buy at home; for there you can select your trees in the row, see

them taken up, get better roots, and get them home in better condition. The home nurseryman, too, is likely to know what is best for his locality, and to grow it. The stock will be better acclimated.

Mr. DARROW agreed that the nearer home good stock may be obtained, the better. Yet it is well understood that some kinds of stock may be better grown in some states than others. Peaches can be as well grown here, but pears do better in New York, and so do plums, though the adult trees do equally well everywhere.

Mr. SWINGLE: I have bought and sold pear trees from Rochester and Geneva, N. Y., and Bloomington, Ill., yet never got nor saw any that do better than those grown right here in Michigan.

Mr. PRATT: We of Oceana county can not get strictly home-grown trees, so have to go outside. I have got my best in Kalamazoo. Our people have been greatly misused in this respect, and some orchards are worthless which should have made their owners wealthy. Much worthless stuff has been shoved off upon us. Stock from the Ilgenfritz nursery has done "grandly."

Beginning the session of Wednesday morning, President LANNIN announced committees thus:

Resolutions—N. W. LEWIS, C. H. DARROW, W. F. ILGENFRITZ.

Fruit—WM. A. TAYLOR, M. H. HITCHCOCK, J. L. HOPKINS.

O. BEEBE of South Haven presented the appended paper on

GRAPES FOR MARKET AND DESSERT.

"Let us consider the best five varieties for market purposes. There are a few things which are essential elements of the market grape, without which failure is absolutely certain. First, we must have a strong, healthy vine, a good grower, with thick, leathery foliage, fairly early, so as to insure always ripening, with all possible power of resisting mildew and rot, and it must be a regular and prolific bearer. For best results it must be large, (medium, certainly); if small, it must be of extra quality or it will not sell well. The clusters should be large and attractive, both in color and form; berries close set, better with shoulder, for the market is governed almost entirely by attractiveness of the fruit and package, and not by the quality of its contents.

Now, what five varieties have we that approximate nearest the description given, among a long list of good grapes? I shall not name any untried or questionable sorts, but shall select from those well known, and leave for future development those kinds so highly recommended by some among the newer varieties. I shall first name the Concord, the old, iron-clad, universal favorite, as one of the very best. Second in order, but first in fact, of the black grapes, is the Worden, as hardy as Concord, can be grown over as wide an extent of country, larger in berry and bunch, and in flavor far surpassing it. Third, the Niagara, a white grape of unsurpassed beauty, of enormous size bunch, berries very closely set on the stem, of very fair quality, and when packed in a tasty package is bound to sell whether others do or not. The vine is very hardy and prolific, an immense yielder. Fourth we have the Brighton, of Catawba appearance and flavor, clusters larger and handsomer, earlier than the Concord, a strong vine and very prolific. I have hesitated some about the fifth, between Moore's Early and Champion, as both are very early, coming into market ten days before either of the others named. But from my own

experience, having fruited both more than ten years, I have decided in favor of the Champion. Neither of them can possibly lay any claim to being good grapes, but my Champions always sell higher than my Concords, in Chicago, and the Champion will produce more than double Moore's Early. I am in love with the money and not with the Champion grape, so my choice for five market grapes is Concord, Worden, Niagara, Brighton, and Champion, as coming nearer the mark than other well-known sorts, all being strong growers and good bearers.

I hope you will pardon me if I retrospect a little and note the progress that has been made in the culture of the grape, and some of the steps by which we have arrived at our present standard in judging of the good or bad character of the grape for dessert. I remember well, when in the swamps of Ohio, we used to go long distances to gather grapes that for flavor would discount a crabapple or scarcely surpass a green persimmon, and we really thought them good. The first cultivated grape I ever saw was the Isabella, which was so far in advance of the wild grape that I really concluded that the best results had been reached. Next came the Clinton and Catawba, the latter of which is really good when it can be successfully grown. Then came the Delaware and Iona, the former of which is still among our very best dessert grapes. It has been by such successive steps that the public taste has become educated up to a very high standard for dessert grapes. The advent of the Delaware and Catawba was some fifty years ago, and from that time to the present the great question among originators has been to produce a grape as good or better in flavor than the Delaware, that should combine all the excellencies of the Delaware with larger size; better foliage, hardier, and more prolific. Have we succeeded? Let us see. Now there are such a host of aspirants for favor, that, if I leave out any man's pet, please remember that in writing you might also leave out mine. By the best dessert grape I suppose is meant that grape which, all things considered, would please the greatest number of people and put them in the best of humor, with the world in general and grapes in particular, after enjoying a good dinner. For this purpose, I will state what I consider the requisites to a first-class dessert grape, and then state the five kinds that I think approximate nearest to that standard. I shall not be guided wholly by my own taste and notions, but shall defer somewhat to the authorities. I will name a few of the newer aspirants for that honor, but shall select from those already tested and found to be valuable. The dessert grape should possess sufficient vigor of vine and leaf to produce a crop, and as much resistance to mildew and rot as possible. In flavor it must be pure and delicate, and such as to please the taste of the grape epicure, with no bitter taste in the pulp or skin; seeds small and few of them; bright and handsome; cluster, the larger the better if well formed. I will now name a few such as Prentiss, Duchess, Lady Washington, Pocklington, Janesville, and a host of others that I have fruited or seen in others' vineyards. These are comparatively well known and all fall short of filling the bill. But there are a lot of younger scions of this family that I have not sufficiently tested to speak of understandingly, among which are Moore's Diamond Empire State, Poughkeepsie Red, Woodruff Red, R. B. Hayes, Moyer, Eaton, Eldorado, August Giant, etc., all claiming to be the very best. I have them all, and shall not name any of them in my list, for want of sufficient testing of their merits. This brings me to the work in hand.

Which are the favored five? I shall first mention the old standard.

the Delaware, not because I think it the best, but some one might think it ought not to be relegated to the rear so soon; so I name it first. Its habits are so well known it needs no description. Its faults are too weak vine, poor foliage, and just a little tenderness. Next Worden, a seedling of Concord, as hardy in all sections as that old iron-clad pioneer: larger in cluster and berry, and ten days earlier, with flavor so much better that I place it at the head of dessert grapes, all things taken into account. I have at the fairs made a test by giving out to the crowd a cluster of each of my best sorts, have each one sample them and pass them on, and eight in every ten gave Worden the preference. Now comes the Lady. It also is a seedling of Concord, originated by George W. Campbell of Delaware, O. It is a good but rather slow grower, white, large berry, cluster medium, very handsome, with a sprightly, aromatic flavor that is sure to please every one. It never mildews or rots, its leaf is good, it is early. Fourth, Brighton, originated by Jacob Moore of Brighton, N. Y., a very strong grower, healthy foliage, as free from rot and mildew as Concord, cluster a very handsome inverted cone, close set with beautiful berries the size and color of Catawba and more than equal to it in flavor and form; from four to six weeks earlier, pure, delicious, sweet—the front rank grape, in all respects one of the best. Now for the fifth. It may shock some of you, but you will pardon me, for I shall say Massasoit, the Rogers No. 3. It is a very strong grower, ripens early, is very handsome; and beauty, you know, goes a great way particularly with us men, and I doubt if there is a finer looking grape in the catalogue than the Massasoit—sweet and delicious, free from musk, and a first-class keeper. I have often had it at Christmas for dessert; a little inclined to mildew, but a little sulphur or Bordeaux mixture makes that all right. Now, as I am to select five for dessert, they will be: Delaware, a long keeper; Worden, will not keep so well; Brighton, another long keeper; Lady, also a good keeper, and Massasoit, that with care will keep till February. So, with these sorts named, with a little trouble we may have the finest grapes on our tables from September 1 till February.

Now, gentlemen, contrast this with fifty years ago, when the *Isabella* comprised the entire catalogue of grapes. Today fifty different varieties is not an extravagant number for one man to have, and all better than that, and some of them are so much superior that to contrast them becomes irony. Tell me, gentlemen, if you can set any limit to the possibilities of grape-culture of the future. What will we have fifty years hence?"

MR. PHILLIPS: I should not differ much from Mr. BEEBE. He has well defined the qualities of a market grape, yet we must have one more—earliness. It is of no use to plant those likely to be caught and damaged by frost, as many are. For market, for the lake shore region, my choice would be, in order as to value, Niagara (five days earlier than Concord, large, attractive, and of fair quality), Worden (same season as Niagara, perhaps a little earlier, a good shipper, strong grower, abundant bearer), Brighton (of first quality and a strong grower), Delaware (has some weak points but always sells well), and Moore's Early. The latter is ten days earlier than Concord, nearly equal to Concord in quality, and has the merit of ripening its entire crop at once. The Champion is entirely unworthy of cultivation because of its poor quality. For dessert I would choose Delaware, Brighton (whose quality it is hard to excel), Iona (not everywhere successful, but of high quality), Lady, and Lindley. The latter is a very superior red grape, good also as a market sort, earlier than

Concord, and highly recommended by the late Prest. Wilder. A fine grape also is the Jefferson. On the hills about Shelby, I am confident, these market grapes would succeed. I advise planting them, for they will help out when peaches fail.

Mr. LEWIS expressed a strong liking for the Concord, and asked if there is not more money received for it than for any other sort grown in Michigan.

Mr. PHILLIPS: Not in proportion to the number of pounds produced.

Mr. ROBINSON: Has any one made a success of grape-growing in Mason county, year by year, the past ten years?

No one could say any one had. But Mr. QUACKENBOS said the Champion always ripens there and the Concord matured three years in ten; yet Mason county is too far north for successful grape-growing. He asked if any of the vineyardists present practiced summer pruning.

Mr. BEEBE: I do not, as a system, but prune whenever I find the vines running wrong. I tried the pinching-in system on a few vines, but not with success.

Mr. LANNIN: I have gone over my Niagara vines and nipped this season's growth off at the third leaf beyond the last bunch of fruit. I believe this to be the right way. I know it does not harm the vine and that it makes good fruit. It enlarges both the leaves and the berries.

Mr. QUACKENBOS: On my soil the vines will grow from eight to ten feet in a season, and I know there is no use of so much.

Mr. LANNIN: Let no wood grow except what you have need of for next year. To do so is to take from the fruit the sustenance of the vine.

Mr. MERRITT: Why put the Concord in the market list, when it always sells at a low price and you can do so well with the Niagara?

Mr. BEEBE: Because it is one of the best five, though not equal to the Niagara.

Mr. MERRITT: I would not put in a grape that we can not make money from.

Mr. HOUK: The Concord is too late for Mason county. I have some vines but they have ripened fruit but twice in ten years, and I wish they were out.

Mr. BEEBE: I would recommend the Janesville and Champion for Mason county.

Mr. J. G. RAMSDALL of South Haven sent the following paper, read by W. A. TAYLOR, upon

CULTIVATION OF GOOSEBERRIES.

Having written a paper on the cultivation of gooseberries and currants, for this meeting, and expected to be present with you, I rested easy until the time should arrive to go, when I found that circumstances prevented me from attending, and also that by some strange accident my paper was mislaid or lost. Now as the programme has me down for a paper on gooseberries and not currants, here it is, with much haste and many regrets.

The cultivation of gooseberries has never been a business of much importance in the United States until about thirty years ago, when some very unsuccessful attempts were made to introduce the large English varieties. These foreign kinds proved, almost without exception, very sad failures. Removed from the cool, damp atmosphere of England, to a cli-

mate of drouth and burning sun during the summer months, they were soon attacked by mildew and mould, losing their foliage in midsummer and being thereby made worthless. About this time the Houghton seedling had been generally disseminated and planted by nurserymen and fruitgrowers. This was a great accession over the old prickly natives that were cultivated in some gardens and the fruit eaten and relished by those who had none better. Although of small size, the Houghton was a great bearer, had good flavor, and was not subject to mildew. So it became popular and was largely planted for family use and general market. But this favorite was soon succeeded by the Downing, a much larger fruit of a greenish yellow color, good flavor, and entirely free from mildew. The bush is a very strong, upright grower, and when properly cultivated holds its foliage through the summer until frost removes it. This is the only variety I have ever known that fully sustains this character. Smith's Improved is its equal in size and quality of fruit, but an ordinary drouth causes it to drop its leaves, which enfeebles the bush and makes it shorter lived. The same may be said of all the newer varieties, as far as tested, including the great Industry. This also mildews, in the west, in seasons of drouth.

The cultivation of gooseberries for market is receiving some attention at this time, and although there is nothing mysterious about it, it requires a degree of care not generally given to it in order to secure success. The best soil for gooseberries, other things being equal, is one that will stand a severe drouth, yet not wet. A good sandy loam, well enriched in the fall before planting, will not give as strong a bush as a muck soil, but it will give better crops of fruit, is easier cultivated, and the bush longer lived. A heavy, strong clay, even if it is well drained, is not desirable, for it requires a great amount of labor and the plants heave out in winter. A dry, gravelly soil should be avoided, for severe drouths will ruin both fruit and bush. If not too strong, a good clay loam is always good, if worked so as to stand severe drouths.

If gooseberries are planted seven or eight feet by five, the cultivation can be done much more perfectly and with less labor than if planted nearer. The ground should be plowed or cultivated but one way after the second or third year, and never plowed in the growing season but late in the fall. The roots of gooseberries do not go very deep into the ground, but keep quite near the surface. Therefore plowing must be very carefully done or they will be very seriously damaged. Most of the cultivators in general use run too deep for the roots of gooseberries. The spring-tooth (one-horse) is the best, if set very light. The double shovel should never be used. One reason for planting gooseberries seven or eight feet apart one way is to give room to work the ground thoroughly, without injury to the roots, and to afford good surface drainage in the winter. It may sound a little strange to some of you to talk of plowing any kind of small fruits late in the fall, for drainage and winter protection, but my experience has proved it necessary to prevent the bushes from being raised up by the frost. I have practiced the following system of fall cultivation for both gooseberries and currants for the past twelve years and have not failed of a full crop every year: Late in October or November I take a sharp steel plow, with one horse, and set the wheel so as to plow not more than two inches deep, and plow the first two furrows toward the bushes, as closely as can be done without injuring the limbs. Then plow one more furrow about one or two inches deeper; and

for the last two furrows, in the center of the row, I take a two-horse plow and plow as deep as the team can draw it. If the bushes are six or eight years old, there will be some small roots in the middle of the row, but cutting them off at this time of year will do no harm, but be a benefit. Never break any roots, at any time, within two feet of a gooseberry or currant bush. Whenever manure or ashes is applied, which should be in the fall or early winter, it should be before the last two furrows are plowed, so as to prevent it from working down into the dead furrows. If the plow does not throw the first furrow well up under the bushes, it will be necessary to do it with a hoe or shovel, leaving the ground a little higher under the bush. This ridging of the ground not only protects the roots of the plants and affords perfect drainage, but the earth will be dry and in good condition to work in the spring when a flat surface can not be plowed nor cultivated. The cultivation during the spring and summer will work the ridges all down by the time the fruit is ripe enough to gather.

No limbs should be let grow down so near the ground that a common hoe can not be worked under them. No suckers nor sprouts should be allowed to grow after the second year, for three or four years, or the bush will become so thick that the size of the fruit will be reduced and picking will be difficult. After six or seven years the bush will need renewing by cutting away the old and weak wood and letting two or three thrifty sprouts grow each year where they have room.

Once in two or three years, gooseberries should receive about twenty-five loads of well-rotted barnyard manure and muck, well mixed, and as many barrels of unleached wood ashes, to the acre, applied late in the fall or early winter. This will always pay, unless the cartage is more than two or three miles. Beware of foul seeds, especially Canada thistles, dock, and grass seed. If any of these get a firm hold under the roots of the bush, they never can be exterminated. If the pruning has been properly attended to, the picking can be done with more leisure and less expense than any other of the small fruits, and will give as good returns. The green currant worm is not very troublesome. Two teaspoonfuls of white hellebore to a pail of water, sprinkled on the bushes, will be sufficient."

THE QUESTION-BOX AGAIN.

The contents of the question-box were considered with this result:

1. *Is it advisable to set a later peach than Smock?*

Mr. HAWLEY: No. I have Salways but they do not often ripen. As a rule, Smock ripens.

2. *Can currants be profitably raised, and is Fay a desirable variety?*

Mr. ANDRUSS: Yes, as to both.

Mr. HAMILTON: Fay is not the most desirable.

3. *How can gooseberries be trained so as to keep the bushes from the ground?*

Mr. LEWIS: By clipping the limbs short enough so that they can hold up the fruit, doing it either in the spring or during the season of growth.

4. *Does any one know whether the curculio ever eat?*

There was a general belief that they do, necessarily, and of the foliage of the trees; and that consequently they may be poisoned and killed by the arsenites.

5. *In setting grapes upon hillsides, should terraces be made?*

Mr. BEEBE: Yes, else the soil will wash out.

6. *Is the Industry gooseberry subject to mildew, and in what season?*

It was said to be, to some extent.

7. *Has the grafting of grapes been a success?*

Mr. PHILLIPS: Yes, a good success. It is done upon the same principle as the grafting of the apple, cutting off the vine low down and inserting scions just before flow of sap begins.

8. *Are curl-leaf and leaf blight the same?*

No.

SMALL FRUIT CULTURE.

Mr. MARTIN HITCHCOCK of Ludington, invited to speak on small fruits, said he had been trying to grow them for profit. I had new land, from which I took the stumps and stones and put on a dressing of barnyard manure, putting in a crop of corn the year before setting the bushes. I set the plants six by four feet apart. I have the Cuthbert and Gregg, with a few Brandywine and Clark for trial. My best success has been with the former two. I prefer plants which started in the spring, gotten near home. I set two in each hill and pinch at one foot in height. I cultivate the soil well, keeping out suckers and weeds. I have been through six times already. The second year I pinch at two feet and let the laterals grow, cutting them at one foot in the spring, removing all old and surplus wood. I prefer sandy loam for red raspberries and clay loam for blacks. I cultivate the Wilson strawberry still, and came here to learn of other kinds. At five cents per quart there is a good money in strawberries, but I would not like to take less. I would like to get eight cents for raspberries [A voice: I wish you could.] which I usually do, as they do not yield as many bushels.

Mr. ROBINSON asked as to the Shaffer raspberry, and Mr. BEEBE highly recommended it.

At the opening of the Wednesday afternoon session, President LANNIN was to furnish a paper upon

PEARS—VARIETIES AND MANAGEMENT,

which he did, reading one he had formerly given and which is printed in the Report for 1888 of the Michigan State Horticultural society.

Asked to state what varieties he would choose, and how many of each, for an orchard of 1,200 trees, Mr. LANNIN said this would differ according to locations. For his own farm, which is rolling, though not very high, which has a clay subsoil and is of gravelly loam, the clay approaching the surface in places, he would choose twenty-five Madeline, one hundred Clapp's Favorite, two hundred or two hundred and fifty Bartlett, two hundred or two hundred and fifty Anjou, one hundred Onondaga, two hundred Bosc, one hundred Sheldon, one hundred Buerre Diel, and fifty each of Goodale, Winter Nelis, Mt. Vernon, Frederick Clapp, Lawrence, and Seckel.

Responding to questions, Mr. Lannin said there were but three or four varieties desirable as dwarfs—the Bosc (if double worked), Duchess,

Louise Bonne de Jersey, and Howell. But the latter is prone to drop its fruit by winds. He prefers two-year trees, but would rather have a good, vigorous yearling than a three-year-old. Cultivate corn or potatoes with the trees the first year; but if they are on turned sod, stir the ground about the trees before the other crop is ready for the cultivator. Prune the young trees to whatever extent is necessary in June. In packing, he would make two grades and culls and send in barrels two bushels and three pecks in size. For sandy land he would prefer dwarfs (Bosc, Duchess and Louis Bonne de Jersey) with a load of clay to each, setting a rod or fourteen feet apart.

Mr. HOPKINS would place them but twelve feet apart.

JASON CARPENTER of Shelby set, thirty years ago, in sandy land, several dwarf pears, hoping to get fruit early; but all those which did not root from the pear died because the scions grew so much faster than the quince root.

Mr. LAFLEUR'S choice, for the main crop, next to Bartlett, is Flemish Beauty, and this is generally the judgment of growers in his vicinity.

Mr. PHILLIPS: It is the only sort which succeeds on the sandy lands about Grand Haven.

Mr. QUACKENBOSCH: With me it cracks on heavy soil.

Mr. ILGENFRITZ: Flemish Beauty, Clapp, and Bartlett are in all ways the standard pears throughout the northwestern United States. One half of all our sales is of these.

To this Mr. DARROW agreed, adding that Anjou and Seckel are next in order.

Mr. A. C. MERRITT of Casco read the following paper, adding various observations as he went along, on

COMMERCIAL PEACH-GROWING IN MICHIGAN.

"It has been said that every subject in the universe is linked in such wise unto others, that before some single thesis could be taken and followed out in all its branches, the wandering thinker would be lost in the pathless forest of existence.

Now, I don't want to lose myself, or get you outside of the branches of the peach business, or the peach belt. But as I was asked in a letter from our good brother, the secretary, to treat the subject as fully as possible, from my standpoint, giving both sides a thorough airing, I am constrained to confess that I felt far more like running away than appearing here to tell so many of you what you already know better than myself.

Within "the visual line that girts me round," many of you certainly have made as thorough a canvass as myself. However, I had given my promise and could get no release.

Commercial peach-growing in Michigan, like any good business, should be predicated upon the reasonable probabilities of success, over and above the rational probabilities of failure. Because a man that depends on his business to make and maintain his home, and to meet his varied responsibilities, next to seeking first the Kingdom of God and his righteousness, he should see to it that the character of the business is useful, that its foundations are well laid; worth the cost; and that they have in them a reasonable warrant for the fulfillment, in a good degree, of the ends in view. For a man may not consider his business a thing apart from himself, as though it touched only his pocket. A business may be such, and

be so conducted as to mar and debauch the soul of him who conducts, beyond the recognition of decent manhood. It elevates or debases; it expands and blesses, or it contracts and hardens; it touches his every treasure and trust. He may make it tributary to all the good purposes of his life. He may make it more significant than himself, and he remain only an appendage thereto. The sacredness of business, and it certainly has that quality, is in the scrupulous use of the means and opportunities afforded for *higher* ends. Its real and relative value is in proportion to the amount and kind of these means and opportunities. Hence, too much emphasis can not be put upon the importance of finding this reasonable amount of success before engaging in it.

One may say, "figures won't lie," and figure out apparently a trustworthy foundation for a business. These figures can not tell the whole truth, and mistakes, purposely or otherwise, are his, a most delusive foundation. Reasons may seem unanswerable, and yet go wide of the mark and far from the truth. It has been said that *one* FACT is worth a thousand reasons. Let us look at some of the facts that environ this subject, pro and con. Ugly facts are better than mere fictions, if we are led to fortify against the one and to build not on the other. The first and most important topic I wish to name, is suggested by the last clause of the subject you have given me, "in Michigan."

The first and greatest fact is lake Michigan, a good strong "pro," but for which our subject would be without a location or name in Michigan. It is as venerable as the everlasting hills and will endure while the rivers run to the sea. Twenty-four years ago I made her acquaintance upon a quiet sabbath afternoon. A dear friend was at my side; a dark-haired boy of four summers, with whose cradle lullabys were mingled the songs of war time, which some of you must well remember, stood a step nearer the bold bluff. The scene was entrancing. The glorious sky seemed to have laid an offering of all her hues, in great fields or belts, in wondrously beautiful, changing contrast to each other, upon her swelling bosom. The waves seemed to kneel upon the shore, and their gentle murmur seemed an ascending hymn of praise, when the child, with involuntary utterance, broke the silence and voiced our feelings in the chorus of the song, Michigan, my Michigan!

So we who are here this afternoon may well express our tribute of appreciation and sense of possession in the same words. For our glorious lake Michigan is the mother of the peach-belt. Her heart is too large and warm to be frozen in winter, and then it is that she sends, by every passing breeze, to the lands that embrace her, the warm kisses of her love, and in the mellow autumn time the high places of our state blush with the gold and the crimson of the peach. But not always. Don't reckon too surely, for opposed to this greatest "pro" is a very damaging "con." No less a fact than that the east or easterly wind, or a still atmosphere in a dangerous cold time, may prevent "*our* Michigan" from keeping the temperature high enough to save the buds, even in the best locations.

And right here, over and against this "con," is the fact that in these best locations not more than from three to five entire failures have occurred in twenty-four years. It is another fact, under the subject of location, that during this time three of the worst failures have not been so much due to extreme cold as to a premature development of the buds. In February, 1879, the buds were as large as well-cured Canada peas. This was true of northern and western slopes and clay land, the very best loca-

tions to resist this liability. Of course there were no peaches. It has since been true, twice at least, that locations with heavy soil and good lake exposure have escaped with a partial but paying crop, while adjoining orchards, with porous soils and level surfaces, or southern or eastern slopes, lacking little in lake exposure, have practically entirely failed. Hence we see that the surest locations may not be the best of peach land, for that should not need surface nor underground drainage.

The "*best*" location, if it has not a western slope, certainly should not have an eastern, though that is better than its foot lands, if ever so dry and perfect in soil. The best locations, without regard to soil, are sure to encounter, and not seldom, this fact. Another "*con*," is so much exposure to cold winds or rains, or all combined, in the delicate blossoming period, that more or less of the varieties will receive serious damage most seasons.

Another fact, both a "*pro*" and "*con*," is that many poor locations, some seasons, will produce as well or better than the best. This is commercially a damage to the business, affording no balance or profit to the producer, and not always to the consumer.

The topic of location nearly includes that of peach lands, but does not include the important facts that clay lands will tax you two or three times as much, or more, according to seasons, in the thorough, careful cultivation of orchards, as the easily tilled lands; and that in these clay orchards, a satisfactory condition of tilth is seldom attained and maintained for a sufficient length of time.

Facts show that the study of varieties, with reference to location, is of vital importance. While the history of most orchards would very likely prove, beyond a doubt, that great advance may yet be made by the more cautious and intelligent selection of varieties, they as likely also prove that large experiments in novelties or new varieties are too costly and damaging. Only one season in twenty-four have all the varieties of which I have been observant done fairly well.

The curculio is a very trying and expensive enemy to the business, an enemy that often makes eternal vigilance the price of peaches; and here, eternal vigilance is especially inconvenient and expensive. The sheets and bumper offer the most feasible plan for their destruction.

Diamonds are costly, but Victor Hugo says they can not rot. Peaches can, and often do, seriously. I recall one season of which this was true through the entire succession. There is no remedy for the wet or damp and hot, still weather. But much of it can be prevented by thorough work in removing the specked and rotten peaches.

This prevention is not reckoned in ounces, but in oft-repeated, hard, careful work; and after the leaves have fallen should be reviewed again till none are left.

Large, fine peaches have sometimes netted the grower enough per bushel to pay for a barrel and a half of flour. Very often poor ones sell for less than enough to pay for the packages and freight. These facts have in them a wonderful emphasis in a valuable direction.

The *fact* that good results follow the thorough practice of destroying the tree wherever that evil *disease*, yellows, is found, is worth more to commercial peach-growing in Michigan than all the theories, remedies, talk, and thought that this much-agitated subject has engendered.

While it is true that some have done remarkably well in the business, it seems apparent that *more* have not.

The harvest and market season should be one of great joy and cheerfulness, for it is one of great strain and weariness; and blest are they who have skilled and interested helpers at their call, especially if they are of one's own household. And, happily, the business at this season seems adapted to unite and enthuse the entire force in sympathy and zeal and cheerful labor.

For the discouragements and losses in the present ways of marketing, we have no sure remedy to command, hoping that happy solution may be reached by others.

To those who like the business there is much to interest and stimulate taste, admiration, and thought, and afford abundant pleasant occupation. To those who do not like it, it is very unsatisfactory, for it is very exacting, affording very brief space for many of the various kinds of work, and often has to be done under extreme difficulties and serious losses, and always has in it an element of uncertainty.

We commenced this subject with lake Michigan as the first great fact, the underlying foundation of the business. We close by suggesting that it should have as its first and most important factor, an honest man, intelligent, with taste and liking for the business, at its fore-front, all along the line, and closing up the rear, carefully forecasting his plans and heroically intent on timely work in the orchard, in selecting, in planning, in cultivating, in pruning, in capturing the curculio, in destroying the rotten peaches, in eradicating yellows, in thinning, in picking, in honest work in the packing-house—thorough work *everywhere*.

For commercial peach-growing in Michigan is a most exacting business, with the "pros" and "cons" too nearly balanced for fun or for the weak and *vacillating* or dishonest, daily calling for that eternal vigilance which crowns with success only those who hear and heed her stern, inexorable voice.

Mr. HAWLEY took up the subject of preparation of trees for planting, and illustrated pruning by means of trees and branches brought upon the stage. In planting, he cuts off all broken roots and defective ones; next cuts off all branches, just missing the axillary buds on the main stem, then cuts off that stem to the proper height, which varies according to the size of the tree. Sometimes, when the trees are strong, he lets stay a few leaves. All pruning must be done by the first of August. Incline the head to the southwest, or leave more head on that side.

Mr. LANNIN said, to straighten a curving body, slit up the bark on the concave side. To this Mr. ROBINSON agreed but Mr. HOUK dissented.

Mr. HAWLEY believed cutting back to be beneficial as a preventive to curl-leaf.

Mr. LAFLEUR told of a grower who cut down young trees, when setting, to the lowest bud which would grow; and using that, made fine, round heads, the lateral branches coming out in regular order.

Mr. LANNIN would not shorten-in trees, when healthy, nor allow the center to run up.

The Wednesday evening session was opened by the reading of a paper on floriculture by Mrs. E. M. STRUCK of Hart, which was followed by one by G. H. LAFLEUR of Allegan, which below is given in full:

THE APPLE THE UNIVERSAL FRUIT.

I am aware that in this and adjoining counties the peach and plum are the leading fruits, hence a paper upon apples may not be particularly interesting to you; yet you will pardon me if I venture a few words in defense of the apple—the world-renowned fruit of the temperate zones.

From the most remote period of which we have any record, the apple has been referred to both in prose and song.

While the apple may not possess all the virtues attributed to it by the ancient mythologists, it does possess medicinal properties hardly equaled by any other fruit.

The apple has been the one universal fruit, following closely in the footsteps of man wherever he has migrated and founded a home and society within the limits of the temperate climate, bringing health and wealth to thousands, and gladdening the hearts of many of the early settlers of this and other states, where men and women have ventured to make for themselves and their children a home and a country. May its productiveness, its usefulness, and its good qualities never grow less.

The settlers of this continent brought with them from the old world, seeds of the apple, which were planted and grew to trees of bearing age; this was followed by bringing from Europe buds and scions of choice varieties, from which, by gradual improvement, has come the giant list named in the catalogue of America's unrivaled and best fruit—the apple. The sun shines not upon a clime nor a land on the globe better adapted to the apple than is found on the American continent. Michigan orchards are unrivaled, and Michigan apples when honestly packed and properly handled are world-renowned for their beauty and good quality.

There are two questions to be settled in the selection of varieties. The first one is to select the kinds needed for family use, commencing with the earliest to ripen, continuing in succession to the winter varieties. This list should not be selected for productiveness alone but for quality and adaptability to the wants of the family. No better investment can be made than the time and money spent in securing the family orchard. It seems to stamp the home with a show of respectability and comfort, which should be more fully realized. The second question is, what are the best sorts to plant for market? This is also an important one. A mistake here will bring great disappointment and financial loss. I may here add a word of caution. Don't set too many kinds for a commercial orchard. Three or four varieties as a rule are better than more. No one list can be made to suit all localities. A list suitable for any one point in the state might not be suitable for some other part. Different varieties of apple are affected by soil, climate, and location to such an extent that actual test can alone decide the adaptability of varieties to any particular locality. I know of no better way to settle the question than by personal inspection of the orchards in the town and county where you intend to set your orchard. Any grower will readily tell you which variety does best with him. By this means one can learn the relative value of the different kinds grown in that section. The best and most reliable information can be obtained by joining some horticultural society and helping to maintain it in your own county. The best fruitgrowers are to be found at such meetings, ready to give their experience upon the points on which you need information. This will require a little time and cost some money, but you

get in return more than the cost, the satisfaction of feeling that you are up with the times and well posted in these matters.

In selecting a site for the orchard, high, rolling ground, well drained, is preferable. This point of drainage should never be overlooked. Wet feet will produce heart disease in the apple tree as certainly as the miasma of the swamp produces ague in man; only it may take a little longer time. Always remember that the better the conditions connected with the apple orchard the greater the profits. This rule will work well all through, from the planting of the trees to the packing of the fruit for market. The ground should be thoroughly pulverized and cultivated during the first season, as this keeps the ground moist, and crops of some sort may be grown upon the ground during the first six weeks; in fact, the ground in the orchard should be well cultivated until the orchard comes well into bearing, after which the ground may be seeded to grass and pastured with any stock that will not injure the trees, plowing or breaking up the sod once in three or four years; and after thorough cultivation it may be seeded down again and pastured.

Trees should not be set less than two rods apart. I set my trees forty feet and would prefer to increase the distance rather than make it less. The tree should be set about two inches deeper than it stood in the nursery row. The hole should be considerably larger than the roots of the tree require. Set the tree in its place, throw in some mellow dirt, then with the hand straighten the roots out evenly, then raise part of the fine roots above this dirt and firm the dirt around the roots below them, then throw in more dirt and firm with the foot, covering all of the fine roots, then fill the hole a little more than level, leveling the dirt loose on top. Set the trees leaning toward the point from which the prevailing winds come. The top should be cut back until spring, just about the time buds should begin to swell. The time to commence the formation of the top is the first season they are planted in the orchard. Fix in your mind a model and then endeavor to make the trees conform to that model so far as is possible. If you attend to the pruning in time, every limb can be cut from the tree that is necessary, with a pocket pruning knife.

The apple orchard will respond to good treatment and good feed as readily as any other farm crop. The trees should be washed once in each year with lye or strong soap suds; apply while hot if possible, using an old broom. This prevents the borer from injuring the trees.

If possible to prevent, never allow the trees to lean to the east or north-east. Trees leaning in that direction have the trunk exposed to the rays of the sun and the alternate thawing and freezing in winter injures the sap vessels, on that side, and the borer puts in his work, and the whole south side of the tree is ruined; decay and death follow in time.

I think fruitgrowers have not pursued the wisest course in the past in the manner of gathering, packing, and selling their apples. The common practice has been to go into the orchard and gather all the winter apples at about the same time, pack them, and sell all together in the fall or at best in early winter. By observation you will learn that some varieties ripen and drop from the trees much earlier in the season than others. Such apples should be picked early before they drop. Some varieties will only keep until early winter, such as King and Hubbardston. Such apples should be sold in the fall, while the better keepers can be held later and the long keepers should be reserved for the spring market. A much better price will be realized for apples sold in this way. When

you find that a tree is not the variety you desire it to be, top graft it at once. Every fruitgrower should learn the art of grafting and do his own work.

If the directions given in this paper are followed, and the trees which you plant are fresh and sound, there will be but small loss and a valuable orchard will be your reward. The tent caterpillar and codlin moth and every insect enemy should be guarded against and destroyed. The best method for doing this can be learned by attending such meetings as this. Here you will learn the best varieties to grow, the best methods for packing and shipping, in fact, you will learn to become the best kind of fruitgrower and a good fellow.

MR. PHILLIPS: Did you not make a mistake when you said to wash the trees each year with strong lye and soapsuds?

MR. LA FLEUR: No, sir; I do not care how strong it may be.

MR. LANNIN: Why cut off the limbs of young trees in the spring?

MR. LA FLEUR: Because I do not think it weakens them as much as cutting in the fall. I prefer fall planting because the young trees thereby get an earlier start.

Thursday morning was occupied, the session being a very short one, with the asking and answering of a few questions.

1. *How can pear trees be protected from the slug?*

MR. HAWLEY: By dusting air-slaked lime upon them while wet.

MR. LANNIN: Any day will do, for the mucous coat of the slug takes on the lime and the slug is killed by it. Any other dust is as effectual—even road dust.

2. *In jarring trees for curculio, do we knock off good peaches?*

MR. SESSIONS: No; none will drop that are likely to grow.

3. *Does the sting of the curculio upon the plum, while very small, always kill it?*

MR. LANNIN: Certainly.

MR. HOPKINS: MR. BRYANT of South Haven jars early and then again in August when the second brood is at work.

MR. ADAMS: Many plums are stung which are still all right and show no sign of injury. Not all the eggs hatch.

MR. LANNIN: What do you do with the plums and peaches which fall?

MR. ADAMS: Nothing; but I suppose we should pick up and destroy them.

MR. LANNIN: This should be done to destroy the larvæ.

It was decided to hold the next annual meeting in Hartford.

After adoption of the following reports the meeting adjourned.

REPORT ON FRUITS.

Your committee found the following fruits on exhibition during the various sessions of this meeting:

Apples—Seventeen varieties, correctly named and in a very good state of preservation, by W. B. ANDRUSS of Allegan, comprising the following list: King, Fallawater, Ostend Greening, American Beauty, Stark, Cooper's Market, Golden Russet, Ben Davis, Red Canada, Northern Spy, Smith's Cider, Jonathan, Wagener, Danver's Sweet, Rubicon, Wells, Baldwin.

Strawberries—Plate of Jessie, box of Moore's Prolific, by J. W. HUMPHREY, South

Haven; box of Cumberland and boxes of two unknown varieties, A. B. WHITE, Shelby; box of Sharpless by JOHN SCHWITZER, Shelby; two boxes, one marked Jessie and one Sharpless, by L. B. MITCHELL, Shelby.

Also a sample bunch of asparagus from the garden of D. C. OAKES, Shelby.

All of which is respectfully submitted.

W. A. TAYLOR,
M. H. HITCHCOCK,
J. L. HOPKINS.

RESOLUTIONS.

Whereas, The West Michigan Fruitgrowers' society, and others interested in fruit-growing, were invited to hold a summer meeting at Shelby; and

Whereas, The success of such a meeting and the benefits derived therefrom depend largely upon the people whose place we visit; therefore

Resolved, That we extend a vote of thanks to the citizens of Shelby and vicinity, who have so generously entertained us at their homes, and to those who have so kindly taken us to visit their orchards.

Resolved, That we hereby express our appreciation of the services of those who rendered music, thereby adding to the interest of each evening session.

Resolved, That much credit is due Mr. W. B. ANDRUSS of Allegan for the beautiful display of apples, and to others who exhibited fruit.

Resolved, That we express our appreciation of the press for the very full reports which they are giving of the proceedings of the meeting.

Resolved, That we appreciate the untiring efforts of President LANNIN and Secretary LAFLEUR of this society, in doing all in their power to make this meeting lively, interesting, and successful.

Resolved, That to all who by their essays, talks, and suggestions, have added interest and profit to the meeting, this society offers its most hearty thanks.

N. W. LEWIS,
C. H. DARROW,
W. F. ILGENFRITZ.

RECORD OF THE ANNUAL MEETING,

Held in Hartford, Dec. 15-18, 1890.

The annual meeting of the West Michigan Fruitgrowers' society was held in the village of Hartford, Dec. 15 to 18, and was opened by music by the band and by an address of welcome by H. M. OLNEY, president of the village. President LANNIN responded in behalf of the society. This was followed by reports on the fruit crop along the lake shore the past season. WALTER PHILLIPS said: I never had a better crop of grapes and I consider it was a first-class year, with good prices. I looked up new markets. The laboring men are the bone and sinew of our country and require our fruit, and I do not think it the best way to send across to Chicago where we can only get a small price, but sell it in the interior of our state. I look for a bountiful harvest next year and good prices.

A. HAMILTON: I am sorry to say I can not report favorably for our town of Ganges, which is the banner town of Allegan county for peaches. Last year we marketed 110,000 baskets of peaches; this year, very few. We however expect a full crop next year. The wood has ripened up in good shape and the promise is excellent for the next season.

G. H. LAFLEUR: In east Allegan we can report but few peaches, a fair crop of grapes, and we ripen our grapes I think better than some other places. I think the promise for another season in apples and peaches is very good.

W. H. HURLBUT: I have been about but very little. Some of the towns of this (Van Buren) county had a good apple crop, but at South Haven the crop was poor. I think in an off year the fruit is small and inferior. Of

peaches we had none. I think the main advantage of the lake shore is late springs and late falls. We usually have late frosts but this year we had frosts in September. Still we feel encouraged in the present prospects. Fruit trees of all kinds never ripened their wood better, and if we have no worse weather this year than last we are sure of a good crop and perhaps good prices.

O. BEEBE: The strawberry crop was excellent; but many later kinds of small fruit dried up. We had plenty of dried fruits but no peaches. Pears blossomed full, nearly all dropped their fruit; the same with apples and plums. I had a good crop of grapes. The Worden set well and grew half-size, then dropped off, and I would like to know the reason.

Mr. SHERBURN of Hartford: In apples we were favored. We shipped and dried thirty or forty carloads and our grapes were very fine.

W. A. SMITH, Benton Harbor: I live so near the head of the lake we could not expect good crops of apples, peaches, or pears and we did not have them. However, we had a good crop of grapes and we must depend on providence for the future.

R. MORRILL: We commenced with the strawberry crop, which was a good one and well grown. It was cool up to the commencement of harvest, then the hot weather ripened them up rapidly. We shipped 100,000 crates in ten days when we should have taken twenty, which broke the market. We had only a half crop of raspberries, but 65,000 crates of blackberries, and 50,000 cases of muskmelons which were very profitable, and the grape crop was good. Peaches, nothing; apples and pears very poor. The wood of all sorts has ripened well and bids fair for a good crop next year.

W. A. BROWN: Our fruit crop was not much different from what has been reported. We had too many strawberries for the market. The price was so low that thousands and thousands of cases were left to rot on the ground. Raspberries and blackberries were a poor crop; grapes rotted badly, one half or two thirds rotted. I think this rotting is working north. Apples were a poor crop. I had some forty or fifty baskets of peaches and Mr. Dunham had about 500 baskets, nearly all there were in Berrien county. I visited Oceana county, where they had a fine crop of Alexander and Hale peaches, then nothing until Smock. I saw but four Crawfords. They estimated that they had a quarter of a crop. In former years Oceana county had crops when Allegan and Van Buren had none, and I think it the most favorable of any on the lake shore. One reason is that the seasons are not so severe.

W. H. HURLBUT was asked why the fruit was poor and small in the off years. He said, I can not tell the reason, but my observation is that when we have a light crop it is likely to be small, scabby, and inferior in size and flavor. I think the same causes operate and prevent a full crop.

Mr. BOGUE, Batavia, N. Y.: The crop of fruit in our country was nearly a failure. As is well known, the apple crop is the leading one with us, but this year there were scarcely any in our section. Pears and plums were some better. Of grapes we are planting largely, especially Niagara. We are trying to grow fruit for a purpose, and we are trying to adapt the fruit to the locality. The prospect seems doubtful. In some of the apple orchards the leaves look as if struck with a blight, or as though the fire had run through them. The east and Canada is our best market for grapes. I can not recommend the Empire State only for having a variety.

I think it is a grape for the south rather than the north as it mildews and does not do well.

On opening the Wednesday morning session, the president announced as committee on resolutions, E. C. REID, R. MORRILL, H. CHATFIELD.

W. PHILLIPS, delegate to Chicago Columbian Horticultural meeting, made report of the proceedings at that meeting.

W. A. SMITH of Benton Harbor presented the following paper on

GRAPE-GROWING IN MICHIGAN.

In selecting a location for the grape, preference should always be given the higher ground. Not unfrequently an additional altitude of three or four feet will save the fruit from a killing frost. This rule should apply equally to all tender fruit. This, in connection with air drainage, is the first and most important condition of successful fruit culture.

I apprehend that grape-culture in Michigan is very similar to the same occupation elsewhere, when the soil and climatic conditions are similar to ours, whether in the east or west. The peculiarity of the grape is that it is not confined to any particular locality, soil, or climate. There are few of our cultivated fruits that will bear such wide dissemination as the grape. In the culture of this fruit, the next consideration after selecting the high ground is the drainage of the soil. If nature has not provided ample means for carrying off the surplus water, tile drainage must be resorted to. The grape will not fruit nor live on wet soil. Any ordinary soil, whether sand, sand loam, clay loam, or hard clay, may be successfully employed for this purpose. The hard, compact clay is the most difficult to cultivate and manage, but under good management will, I think, yield large crops and better fruit than any other soil. In the time of maturing I find my hard clay ripens the fruit a few days sooner than the sand. A preference of soil should, I think, be more with reference to certain varieties of grape. A slow, tardy grower requires a good strong soil to support it, while a strong, rampant grower will succeed well in a lighter soil. Grapes like the Delaware must have a good soil, high culture, and plant food, to yield bountiful crops, while such as the old Catawba, Concord, Worden, Diana, Niagara, and others of that class will do well in a lighter soil. I think the Diana will give better satisfaction in a light sandy soil, than any other. Ordinarily it produces too much wood. While a compact clay soil will produce equally as well, if not better, both in quality and quantity, as other soils, it is not always the most desirable, being much more difficult to manage and cultivate. If worked too wet it bakes; if stirred too dry it breaks up into clods. Moreover, it requires more frequent tillage than the lighter soils.

In preparing a worn soil for grapes or other fruits, a good crop of red clover plowed under when in full bloom would pay well in after years. The proper arrangement of the vineyard must in great part depend upon the lay or location of the ground. Whether the points of the compass have any bearing upon the fruitfulness of the vine or not, it is better to consider other conditions. As the land must of necessity be cultivated one way, after the trellis is up, I would prefer to have the rows run with the inclination of the ground. When the inclination is not too great and the soil hard clay or tenacious, this will afford better surface drainage than locating the rows at right angles with the inclination. The distance between the rows

should not be less than ten feet, and in the case of strong growers, like the Concord, Worden, Niagara, and others of that class, from ten to twelve feet in the row. In preparing a heavy clay soil for the vine, a deep and thorough subsoiling should be given, and in marking the ground for planting, either in sand, loam, or clay (but more particularly in clay), I know of no better or more economical way than to run a heavy two-horse plow two or three times in the same furrow. This in most cases, with a little additional hand labor, will be entirely sufficient for all practical purposes. The furrows drawn with the inclination of the land will open up a partial sub-drainage for the young vines and prevent them from becoming water-logged, as when plants are set in holes, especially in a wet season, many find their graves. For the last ten years or more I have adopted this plan in setting both trees and vines, with unfailing success.

In regard to the proper age of the vine for setting, I think strong, vigorous, stocky, two-year-old vines are usually preferred and are certainly young enough. The age of the vine is by no means an essential condition, as an old vine, transplanted under proper conditions, will soon renew its youth and be as fruitful as ever. Sometimes it becomes necessary to remove or transplant old bearing-vines from a certain location. If in this case they prove to be valuable they may be transplanted with perfect safety, even after having fruited ten or twelve years, and in two or three years will bear full crops again, while young vines will require a much longer time to come into full bearing. Trellising, or upright supports of some kind, is an essential condition of grape-culture in our locality, and I think all through the east as well. How best to do this, with the greatest economy in the end, is a point not entirely settled. For posts the best we can get is the white or yellow cedar, set twenty feet apart or thirty feet with intermediate stakes. Whether we use the upright or horizontal trellis, galvanized No. 10 wire will, I am satisfied by an experience of twenty years' use of both, prove more satisfactory than the common black wire. In an upright trellis, two wires, the lower thirty inches, the upper four feet from the ground, give good satisfaction. In the horizontal, three inches would be better, one in the center and one on each side, twelve inches from the middle wire. In place of wire supports, stakes may be used, but, from the necessity of frequent renewals, are objectionable. In the place of timber braces at the end of the rows, a better way in my opinion is to set the end-posts firmly in the ground, at an angle of about twenty or twenty-five degrees from the row, the next post twelve feet in the row. A wire run from the bottom of the end-post to the top of the second post will, if properly adjusted, make both a good and cheap brace. The main top wire should be loosened in the fall to allow shrinkage in cold weather.

The culture of the vineyard, both in its preparatory and fruiting period, should be clean and thorough. The application of fertilizers must depend mainly upon the nature of the soil and the variety of fruit in bearing. It is almost self-evident that the tardy and slow grower, such as the Delaware and others of that class, require higher culture and fertility than the more vigorous growers, and no stimulating application is better than, or equal to, wood ashes, or potash in some form.

In treating upon this point, it is almost impossible to make a selection of varieties without treading upon somebody's toes. But in this matter, as in every other industry or employment, the experience of the past must, in a large measure, be our criterion for the future. In commercial horti-

culture, only such varieties as have been long and widely tested under various conditions, on all soils, and under various conditions of treatment, can be safely recommended for general culture, provided, under those diverse conditions, they have given general satisfaction. In this connection, too, the wants of the market and the demands of the times can not be safely ignored. While the fancy grapes and all other fruits from California find a ready market in all our large, and many of our small towns throughout the country, whenever accessible by rail, at good paying figures, the great fruit-consuming population of the country east of the Rocky mountains must, for the present, and perhaps for all time, depend upon our native fruits for its supply. As a rule, the mass of our people can not afford the luxury of the fancy fruits from California. It is also well known that, in point of quality, many of them are inferior to our home production. The demand of our markets is for a dark-colored grape and this demand instead of being on the decline, is evidently on the increase. I think it safe to say that nine tenths of all the grapes sold in our western markets, and the same ratio will probably hold good in the east, are Concords. While the Delaware is conceded to be the standard of quality among all our grapes, the demand for this grape does not increase with the supply. The demand for it appears to be on the decline, especially when the market is well supplied with the dark grapes. When the so-called white grapes, of whatever variety, are largely grown for market, I doubt not they will be grown at a loss. The best of market grapes for Michigan, and I doubt not the east generally, can readily be counted on the fingers and thumb of one hand. These, in my opinion, are for the present the best grapes for profit, in the order here named: Black, Concord, and Worden; red, Delaware and Brighton; white, Niagara. The time may come, in the next decade or two, when the Worden and Brighton will change places with the Concord and Delaware; and in the meantime, others may come forward and contest the claims of some or all. The white grape, as yet, is a novelty, and when the novelty is gratified I think the fruit itself will be unpopular. This seems to be clearly the tendency of our leading markets now in the west. This lake shore is largely a grape-producing locality, as also are many of the interior portions of our state, and this production is on the increase. Our locality is somewhat anomalous. We are located between two contending forces, the west and the east—California on the extreme west, Ohio and New York on the east. As between our productions and those of California, there is ordinarily but little competition. Each has its allotted place on the market. The one is mainly for the fancy trade, the other for the million; the one pays a high-protection railway tariff tax; the other has free-trade transportation. But not so with our eastern neighbors. They grow the same kinds of fruit we do, and are largely supplying the same markets. We have little to fear from Ohio; they have many home markets for their surplus fruit, and besides they are not so aggressive and ambitious as those York state fellows. The latter are going to crowd our market more and more, year after year. Locality makes our season a trifle earlier than theirs, and if we can take advantage of this circumstance, without throwing our fruit upon the market in an unripe condition, we may generally avoid the glut consequent upon their heavy shipments. If we had the Worden and they the Concord we could easily bridge the chasm. But if we change fruit, won't they too? So we have to trust to Providence and take our chances.

The black rot, mildew, and other fungoid diseases of the grape, are

matters that must in the future receive special attention. Prevention is perhaps the only remedy, and this depends upon discretion, judgment, and the use of proper appliances. The bagging may be a sure preventative, but can never be employed on a large scale when grapes are sold from 1½ to 2 cents net per pound. The frequent application of the Bordeaux mixture will prove far more simple and expeditious, but will require certain appliances, mainly a force-pump of some kind. The time is not far distant when one or both, or some other remedy, must be employed.

Pruning the grape can not be taught upon paper. No two persons will prune alike and no person will prune his vines twice alike. This work can only be learned by practical experience, and then it will require years to become an expert. It is safe to say that a majority of grape-growers leave from fifty to one hundred per cent. too much bearing wood upon their vines. In order to realize the best results, no more wood should be allowed to remain for fruiting than the vigor of the vine can mature. If too much wood is allowed to remain, neither the fruit nor the wood for the next crop will mature in their proper season. This is purely a matter of judgment, and perhaps the least said the better. Suffice it to say that all surplus old wood should be removed and the bearing wood cut back to two eyes. For the first three or four years the prunings should be mainly for wood and not for fruit. For what we gain by early fruiting we usually lose double on later crops. In our state, and growing our present varieties, it is doubtful if summer pruning should be adopted, except in a limited way by throwing out superfluous shoots, pinching back occasionally in case of strong and vigorous growers, or cutting back for the convenience and safety of late culture. In fall, winter, or spring pruning the wood from two rows may be thrown into the same space, thus having every other space clear. Numerous appliances have been used to bunch and remove this surplus wood. The most convenient tool is a heavy, two-horse drag, which will do the work well as fast as a team will walk.

Grapes, like most other fruit, should be mature and well ripened before sending to market. The habit, too much in vogue by many growers, of sending sour, immature fruit to market, can not be too severely condemned. It creates a lack of confidence and begets a dislike among consumers for the fruit in its proper season.

For cutting grapes from the vines and removing imperfect specimens from the cluster, sharp-pointed grape scissors answer a very good purpose. For a package in which to carry the fruit to the packing houses, I know of nothing better or more convenient than the common market basket holding 20 pounds. If the package is prepared by adding two thin strips one and one-half or two inches wide, lengthwise on the bottom, and two corresponding strips on the inside to tack to, to save wear in the frequent handling or moving about, it will last by proper care many years.

In the matter of shipping packages, some localities use one, some another, and some a variety. The twenty-pound box has been largely used by many of our growers, while others use the eight and ten-pound basket. In York state the eight and ten-pound Climax basket is almost exclusively used and is also being largely used in this state. It is a common report here, every year, that these eastern growers procure their packages at lower rates than we do, and also lower freights to our western markets. If these statements are correct, it behooves us to see in time what we can do in the matter of packages and freights. At points where grapes are grown largely for market, and particularly back from lake

ports, where the fruit must be shipped by rail, growers should combine and ship through a general agent, whose business it should be, in advance of the season, to make arrangements for supplying the various markets where car loads can be disposed of, and thus save time, double shipments, and often a glut in the market. But to do this some kind of an organization is essential. California has her fruit exchange and her goods are sold at auction upon their merits. So has southern Illinois, the Maryland and Delaware peach-growers, and I think the York state grape-growers. Whether our circumstances and surroundings will ever enable us to progress far enough to imitate their example in this respect, is for the future to decide. When we have a general fruit crop in this country it becomes an important and leading feature of this industry to find paying markets.

T. T. LYON, president of the State Horticultural society, was invited to the platform and made a few remarks in which he said: I have some connection with the division of pomology at Washington and I wish to make a few statements about the object they now have in view, and ask the concurrence of this society with the division. They think they can assist the state and local societies by interchange of ideas and publications and bulletins of different kinds. The entomological department prints a monthly paper for gratuitous distribution and the same is true as to micology. They publish a quarterly, and these fungi publications are of great interest to all fruitgrowers, and the published reports of the several divisions can be distributed through the society. On the other hand, it is proposed that these societies shall appoint committees to make reply to all questions of the department. Also, they wish to secure specimens of new fruits, to distribute new varieties to experts to test in various parts of the country, and by this means the value of new varieties can be obtained quickly. I propose to visit the remoter northwestern states and meet with their societies and gather new ideas to help formulate a plan for future action. I recently saw Col. Brackett at Chicago, where he is engaged in making colored casts of fruit for the department, and so faithfully has he performed this work, and copied form and color, that it is almost impossible to tell the genuine from the false. He also wishes perfect specimens of new or uncommon varieties sent him, for which he will pay transportation. I understand California has applied for ten acres of space in which to set out orange groves and other fruit, and it struck me that Michigan fruitgrowers might do something in this line—might take up small trees and place them in tubs, and by care and cultivation have them in fruiting condition to place on the grounds at the Columbian exposition to illustrate the fruits of Michigan; and it is also desirable that we go to the legislature as a united body of fruitgrowers and ask for an appropriation for a horticultural display in 1890, and I think we can get it.

A. S. DYCKMAN asked that Mr. LYON state what he thought this society should do, when it was suggested that a committee had this matter in charge and partial report was made, in which it was recommended that this society act cordially with any and all societies to make a creditable exhibit of fruits, and also join in asking for suitable space and an appropriation from the legislature to make a display of Michigan horticulture at the Columbian exposition in 1893.

R. MORRILL: I would like to ask Mr. Smith about the horizontal trellis and what he thinks the proper height for it.

A. H. SMITH: I think in some respects the horizontal is the best at three feet high. It gives more space for the grapes to hang down and for sun, light, and air. I have not used it myself.

R. MORRILL: I understand that at Poughkeepsie, N. Y., they place the trellis high, so that the horse can go beneath it and the vines are almost free from rot.

Mr. BOGUE: We mostly use the upright trellis and I think it best for all purposes.

O. BEEBE: I find the trellis blows over when high and the vines blow down, and I think the single stake plan the best, as my vines even at four feet high break in a high wind.

A. H. SMITH of Paw Paw, who had a fine display of grapes on the table, read the subjoined paper on

PRACTICAL EXPERIENCE WITH GRAPES.

In the spring of 1880 I set a vineyard of 2,000 vines—1,000 Concord, 500 Delaware and 500 of various varieties, including Moore's, Champion, Hartford, Ives, Lady, Martha, Worden, Brighton, etc. The location was a high, steep, southern exposure, with a mixture of all kinds of soil, and very stony. It was new land covered with stumps, some of which were pulled out, but most of them were left until they became rotten enough to pull easily. At present about a dozen of the old settlers still defy all efforts to loosen them.

The vines were set 6x8 feet and the ground occupied was $2\frac{1}{3}$ acres. No crop was planted between the rows, but the vines were kept well cultivated and hoed. The second spring they were staked at a cost of about one cent each, last year's growth cut back to two buds, and given clean cultivation until the first of August, when several days were spent picking up and drawing off loose stone. The third spring the vines were all pruned to one cane, long or short, according to their strength. Every year the cultivation has been the same, beginning about the middle of April, and cultivating every week or ten days until the middle or last of July. The vineyard has been thoroughly hoed twice and sometimes three times each season. On account of the steep side hill and the tendency of the soil to wash, the vines have been trained to stakes and cultivated both ways. The aim in pruning has been to leave the strongest and best ripened wood (new growth) each year, cutting away weak canes entirely, leaving the old wood or main stock from two to four feet high; and at each hoeing breaking off all suckers and sprouts near the ground. The pruning has always been very close, cutting away from $\frac{3}{4}$ to 5-6 of the growth.

In the Concords I have experimented with several systems of pruning, following it up year after year. In two rows, the two longest new canes were left, cutting everything else away. For the first few years these vines bore large clusters, but lately they fail to make sufficient wood growth. In two other rows four to six new canes were cut back to about two feet long, but aside from being a bother to keep so many short canes tied up I could see no difference from the rest of the vineyard. In the next two rows all the canes were cut back to two buds, leaving the old wood each year. This system has made so much old wood that I have had to cut away considerable in the past two years in order to get between the

vines with horse and cultivator. Vines pruned this way have too many small clusters. In the next two rows a bush was formed about one foot above the ground. From this three or four of the strongest new canes were left at each pruning, about four feet long; the last year's bearing canes being cut away and other new canes being cut back to two buds. This plan gives the best results. The clusters average better and the vines seldom fail to produce good canes for the succeeding crop. If I were starting a new vineyard to be trained to stakes, I should follow this manner of pruning, but unless the ground is very steep and hilly I prefer training to posts and wires.

Three years ago I applied half a ton of bone meal to the poorest spots. Fearing it would be washed away on the steep hillside if applied broadcast, it was put in holes made by a hop bar, one pint in each hole, or one pound to the vine. I have been disappointed in the result. The bone is still in the ground. The grape roots have clustered around it more or less and perhaps benefit may come in the future. Nitrate of soda and muriate of potash were applied on portions of the vineyard last spring, but with questionable results. I have used wood ashes more or less at different times, and have about come to the conclusion that the soil does not need potash. A cat-hole near by had filled up with the wash from the adjacent hillside. This dried mud was drawn up the hillside on a stone-boat and spread among the vines with the best of results. When the wood growth is deficient there is nothing like barnyard manure well rotted, but it will be a year from time of application before you will get any benefit; too much manure is a detriment. Stakes last from three to six years. Every spring, in pruning, stakes which will push over or break off are removed and new ones take their place. I cut stakes eight feet long. When they rot off they are still long enough to set again. After a hard wind, just before the grapes ripen, many vines will blow down, and if not picked up the grapes seldom ripen up well.

With me the Champion, Hartford, and Ives yield about the same quantity as Concord but the quality, especially of Champion, is inferior, Moore's does not yield paying crops. Worden is almost like Concord, is sweet as soon as colored, but will not keep so long. Brighton is the sweetest grape, but an uncertain cropper. Martha and Lady have usually borne fair crops and are of good quality. Salem, Wilder, Agawam, and Lindley I usually put away in the cellar for winter. They have never paid as market grapes.

I am naturally fond of figures, and when planting this vineyard I opened a separate account with it. In these figures no estimates have been made. Every item of expense and every hour's work has been charged up. Of course it would be impossible to enter into details in a short article like this. To make it brief I have prepared a table giving the total annual yield and sales, expense and profit of the two thousand vines.

The land ($2\frac{1}{2}$ acres) cost \$175; the vines \$100.64 (vines cost more ten years ago than now); and the cost of plowing, setting, cultivating, etc., was \$42.94, making a total of \$318.58 the first year. The expense for the second year amounted to \$74.25, making the cost \$392.83 to January 1, 1882, and no receipts:

	Yield Grapes Pounds.	Net Sales Grapes.	C'st Prun'g Cultiv'ing, Harv'g, etc.	Profit.
1882.....	4,400	\$195 99	\$132 73	\$63 26
1883.....	4,500	218 72	97 29	121 43
1884.....	8,750	312 36	117 77	194 59
1885.....	7,875	245 62	122 09	123 53
1886.....	6,050	182 71	135 60	47 11
1887.....	20,655	621 63	251 28	370 35
1888.....	9,180	278 06	140 14	137 92
1889.....	4,255	137 70	114 28	23 42
1890.....	18,000	559 93	207 14	352 79
	83,665	\$2,752 72	\$1,318 32	\$1,434 40

In the spring of '85 I planted one thousand Concord vines with a view of seeing how cheap I could grow grapes. The location was high and free from frosts, but not steep enough to wash; soil a strong gravelly loam, which would produce twenty-five bushels of wheat or one hundred bushels of corn to the acre. A clover sod was turned under and fitted as for corn, marking 4x4 feet, and one-year vines set at every alternate mark, making them eight feet each way. Two weeks later corn was planted except at the marks where vines had been set. The field was kept thoroughly cultivated and hoed the rest of the season, and the corn gathered more than paid for the cultivation. The second spring the vines were staked and corn again planted. In hoeing, the two strongest shoots were tied to the stakes and all others rubbed off. This left the vine in good condition to bear the second season, but for some reason the crop was very light and the receipts for grapes were less than what the corn crop had been the previous year. The fourth spring, posts and wires were set, the bottom wire 2½ feet and the top five feet high. In the strongest vines four canes were left in pruning, two for the bottom and two for the top wire, but many of the vines were so small that only the two bottom canes could be left. The crop this season was good, averaging twelve pounds per vine. We picked and shipped about one third of the vineyard, and the balance sold on the vines at twelve cents per basket (about eight pounds). The west side bore the heaviest crop, where the soil was the lightest. In order to equalize matters I sowed four hundred pounds bone meal on this side the following spring. The fifth year (1889) the crop was again light, only 4½ pounds per vine, but the vine made a tremendous growth. Last spring we cut back to four canes, except where the vine had made an extra rank growth, when six canes were left. I do not know of a vineyard in the county that was cut back closer, but the crop was all the vines could carry. The average was over twenty-three pounds per vine. This year the east part bore the heaviest crop, averaging fully three baskets to the vine, while the yield on the west side, notwithstanding its previous dressing of bone, was noticeably lighter.

Until this year we have always picked in holders, drawn the grapes to the packing house and packed the following day. This gave them time to wilt and a good packer could easily make her baskets weigh 10 lbs. This year local buyers came in and a basket was a basket with them, provided the grapes were good and baskets packed full. If very lightly packed they would shade the price a trifle. Considering this, we determined to pack direct from the vines, and were well satisfied with the result. By close figuring we could bring the cost of picking, packing, and delivering

at the depot to 2c. per basket, but it could not be done with inexperienced help. One hundred baskets is a good day's work for a packer, and one man can cover for about five packers. To give the figures for the six years: The land occupied was 1 3-5 acres; total cost the first year was \$135.75; the second year increased the cost to \$156.75; the third year the crop of grapes amounted to 1,800 lbs. and netted only \$25.60. However, this paid expenses and \$1 over, the reason being that very little work was put on the vineyard; other and better paying fruit demanded attention. The fourth year, on account of wiring, the expense was \$63.14, but the net sales of grapes amounted to \$186.42, leaving a profit of \$123.28. The yield was 12,048 lbs. The fifth year a cold rain storm mixed with snow came the 30th of May, when the vines were in blossom and blighted the crop. The yield was only 4,575 lbs., but they sold for \$110.55, leaving a profit over expenses of \$41.71. The sixth year (1890) the expense of pruning, cultivating, hoeing, etc., was \$30.34. It cost \$75 to market the crop, and the baskets, 2,709, cost \$94.82; 1,630 lbs. were sold by weight to home consumers, which if packed would have made a total crop of 2,912 baskets from 1,000 vines. The entire expenses for the year were \$200.16; receipts, \$655.92; net \$455.76—about 250 per cent on the investment. Who wants to go to California?

Nearly every variety of grape requires different treatment either in pruning, distance apart, or in richness of soil. Moore's Early requires a rich soil, and as yet I have not been able to make it produce paying crops. The cutworm, steel beetle, thrip, and rose chafer prefer Moore's to Concord, and I have sometimes thought that might be the trouble, but aside from this they make a poor growth. Delawares need plenty of room, notwithstanding they are slow growers. The past season vines set 6x8 feet produced 8 lbs. per vine; 8x8, 9 lbs. per vine; and a row of 40 vines, 8 feet apart and 20 feet from the next row produced 19 lbs. per vine. Concords at the latter distance produced a less number of pounds, but ripened their crop so the vines were cleaned at the first picking. Of the Niagara I have had but little experience; 100 vines set two years ago, bore only 15 lbs. of grapes this year. I have been unable to keep them in good condition, while Empire State, picked at the same time, is in good condition now.

It is often stated that grapes pay at two cents per lb. The average net price received for Concords in 1886 and 1887 was only 1 7-10c. per lb., picking and packing to come out of this. In '88 it was 1 8-10c. per lb., in '89, 2 2-10c.; in '90, 2 4-10c.; in '85, 2 6-10c.; in '82, 2 9-10c.; in '84, 3c.; in '83, 3 6-10c. per lb.

The net price received for Delawares was in '82, 7c.; in '83, 6c.; in '84, 6½c.; in '85, 5 9-10c.; in '86, 4½c.; in '87, 4c.; in '88, 5c.; in '89, 4c.; in '90, 4 1-10c. per lb.

On account of the scarcity of other fruit this season, grapes have sold well considering the enormous crop all over the country. At Lawton local buyers came in and the bidding was sharp, resulting in very little fruit going to Chicago on commission. Grapes shipped to Chicago Sept. 10 and 11 netted 17c. per basket; 12th, 18c.; 13th, 20c. Sept. 15th I received a telegram from Chicago: "Grapes selling for 26c.; ship all you can." 26c. in Chicago would net 20c. at Lawton, but I sold for 23c. at Lawton, and the price held at 22c. to 24c. to the end of the season. At the same time the Chicago quotations were all the way from 20c. to 27c.

What the future of grape-growing will be with its rapidly increasing

acreage no one can tell. Competition will be strong and only those localities having favorable soil and good shipping facilities can make it profitable.

J. G. RAMSDELL's paper on "Smotheration" was not forthcoming. He said he had prepared the paper, when he understood from the powers that be that it would not be wanted, and so sent it away for publication, and was very much surprised to see it upon the programme.

J. G. RAMSDELL: In this matter of fruit discussion, it has been said the subject is worn out and so we must adopt new names if not new matter, and I adopted "Smotheration" to our common way of pruning, for between the neglect and butchering of our fruit trees, which is so universal, it is a wonder that we have any fruit. The butchering of fruit trees I call smotheration, and is illustrated by the farmer who takes an ax and cuts all within his reach or climbs to the middle of the tree and slashes right and left; while the true theory is to cut out the superfluous branches and shorten back so as to have no dead limbs smothered by too much foliage. This applies more to apples and peaches than to other fruit trees, which must be pruned and thinned in order to bear a crop.

The afternoon session of Dec. 17 opened with a motion by Mr. PHILLIPS, that the time for electing officers be changed to 3 o'clock P. M. J. L. HOPKINS then read his paper on growing apple trees in nursery rows.

The secretary read a paper by A. J. BRACELIN of Watson, given below, on

THE APPLE ORCHARD AND ITS MANAGEMENT.

That location and soil have much to do with the success or failure of an apple orchard, no observing person will deny. My ideal location is a plat sloping toward the south; the soil, any that will produce good crops of wheat and corn and naturally drains itself. Such soil, in Allegan county, is generally a gravelly loam, rich in vegetable matter, containing also a large quantity of lime. The subsoil is somewhat of the same nature, so that no artificial drainage is needed. Unquestionably the location and soil make this county one of the foremost in the state, for variety and fine quality of apples. There are also a variety of soils, running from the light sands of the plains to the heavy, undrained clay bottoms, much of which may be made to produce good apples by making such places conform as nearly as possible to our ideal. The orchard should have perfect drainage and sunlight. Trees will not thrive in shaded places nor in soils containing an excess of water. With our best soils and locations, and with good varieties, it is hardly possible not to grow an abundance of choice fruit in favorable years. Such soils contain a large amount of plant food at present, but the process of exhaustion is going on, and many of our best apple crops are obtained without a seeming effort on the part of the growers. In selecting varieties, one should be governed greatly by a knowledge of sorts that are vigorous growers and bear well in his own locality. Many sad failures could be cited, where persons setting new orchards ignored this principle.

A few thoughts about some of the leading established varieties may prove acceptable. That the Baldwin heads the list of commercial apples there is little doubt. Indeed, it is really a good family apple, and combines more good qualities, taking tree and apple together, than any other apple I know of for this locality. The Greening is another widely known

and popular apple; and, notwithstanding its antics in bearing, no one seems willing to ostracise it. The Northern Spy completes the trio of popular winter apples. A very good reason for setting largely of these varieties is, that while all are really good, consumers have learned their names and ask for them, often because they do not know the names of other varieties. The pippin family contains some excellent fall varieties. Chief among them is Hubbardston. They are mostly good family apples, trees vigorous growers, and are good bearers. The Chenango is an excellent late "harvest" apple. For an early harvest it is rather unfortunate that we have nothing better to offer than the Red Astrachan. Like most of its Russian neighbors it has nothing to recommend it, save hardiness and color.

For a permanent orchard of 1,000, I would set the following varieties: Five Astrachans, 25 Chenango, 50 Hubbardston, 50 Twenty-Ounce and Fall Pippin, 100 each of Greening, Spy, and Jonathan, 500 Baldwin. I would set a few Seeknofurther for those who believe it to be the best eating apple on earth. The remainder I would set to new varieties, as an educational feature. I have given more early varieties than are generally grown for an orchard of this size, because there is a dearth of really good early apples in this locality.

The time is at hand when good early apples will be in demand. A fruit-grower in the state of Vermont said he had no trouble the past season in selling such apples for one dollar per bushel.

The distance apart to set apple trees in an orchard can never be arbitrarily fixed. The difference in soils and treatment is so great that what would prove too close in one case might give plenty of room in another. Trees should never crowd one another in the orchard. When they do so it is economy to remove some of them.

The distance varies from two to four rods apart. There are some varieties for which two rods are far enough. Mr. JOHN GRANGER has a scheme for utilizing the ground while an orchard is growing, by planting between the trees that make up what he calls the permanent orchard, varieties that bear early in life, notably the Wagener, to be removed when they crowd themselves or the other trees. In this way he recommends setting the trees not further than one rod apart. This, to be practicable and economical, should be followed by good tillage. Before commencing on this part of the subject, however, let it be understood that the great object in tillage, aside from destroying the weeds, is husbanding the moisture of the soil, the importance of which may readily be seen if we consider only briefly some of the functions of water in vegetable life. Water enters largely into the construction of all living plants, and forms upward of one half of the newly gathered vegetable substances we are in the habit of cultivating. In the midst of abundant spring showers, plants shoot forth with amazing rapidity, while they wither and die when water is withheld. It contains great solvent power over solids, and especially decayed animal and vegetable matter. Its great affinity for substances such as are supposed to be capable of ministering to the growth of plants, brings them within easy reach of the roots. It is only by having water in excess that the circulation of the sap of plants is carried on, and the exhalation of a medium-size apple tree on a hot summer's day, is truly astonishing. It is quite evident, then, that water is a very necessary article to have and to husband, for every owner of an apple orchard. Indeed, I believe the primary cause of the disastrous failure of apples

this year was the two or three preceding very dry seasons. It has been a struggle for life with many of our strongest trees, and only those which bore no fruit the year before, and had retained a trifling surplus of vitality, succeeded in maturing a few imperfect apples. Seasons when showers come frequently and regularly, there is moisture enough, with fair care, for the trees to mature a good crop of apples. It is only in protracted drouths, such as we have had for the past few seasons, that irrigation or tillage becomes imperative. Irrigation in this section is generally impracticable, but I have no doubt of its great efficacy when water can be supplied in this way.

By tillage is not meant that any moisture is added to the soil; it only prevents it from evaporating too suddenly, and it thereby husband it, to be drawn on by the plants when needed. There continues to be considerable difference of opinion whether fruit orchards should be cultivated or not after they are four or five years old. All are agreed that they should receive the very best tillage up to that time. Standard pear trees seem to do decidedly better in grass, after arriving at a stage where they are able to take care of themselves. Instances can be given where such trees, believed to be 150 years old, standing in sod which had not been disturbed in over fifty years, produced abundant crops of fine fruit, and the trees are yet in a thrifty condition. But as to dwarf pears and apple trees, the treatment should be quite different. Such orchards should be as well cultivated as our cornfields are; or any portion of our vegetable garden. Indeed, New York leads already in this practice, her orchards are kept free from weeds and well mulched by good tillage.

I can not believe, however, that tillage is all; that we can obtain good fruit by this alone, any more than we can good butter and good beef from wind and water; in other words, that we can obtain something for nothing—although farmers come as near doing this in the management of their orchards as is done by any other business I know of. Trees must be fed, and if the food is not already in the soil it must be put there. A large crop of apples taken from an orchard draws immensely on the plant food in the soil, and if this practice is continued (of taking from and never giving back) the soil will become exhausted, trees refuse to bear, and finally die of starvation. We must not cheat the soil out of any portion belonging to it if we expect fine orchards and fine fruits. I know of nothing better, for an apple orchard, than good stable manure spread evenly over the entire surface. It is better that this manure should be well worked into the soil by good tillage; but put on as a top-dressing on sod it will do a great deal of good. Unleached wood ashes are recommended as specially good for nearly all kinds of fruit, and where they can be obtained easily may be used. Apple trees require less frequent renewal than other fruit trees, and under the best management will grow and bear fruit a great number of years.

A moderate amount of pruning, especially of dead limbs, may be done in autumn, but if the trees are to receive much cutting it makes them more tender for the time and should be left till early spring. There can be no fixed rule for pruning apple trees. Remember only that sunlight is absolutely necessary to health and growth of the tree and the production of good fruit, and that stove-wood cut from healthy trees is the dearest ever paid for.

There is much work that may be done in autumn, in an apple orchard. Moss will accumulate on trees in wet seasons, no matter how good the

treatment or cultivation, and the task of removing it is a tedious one. But the destruction of nests and rings of eggs on the branches, as well as cocoons and insects in the crevices of the rough bark removed, will undoubtedly prevent much damage to the foliage in the spring, and compensate for all trouble.

As to spraying apple trees with the arsenites, to destroy the codlin moth, I am satisfied from the testimony of those who have tried it, and the common sense there is in it, that we all shall have to practice it, either voluntarily or by statutory compulsion. I think it is settled beyond question that spraying apples in early spring destroys codlin moth. I am not so positive about its destroying the moth crop in August, after the apple is pretty well grown. However, it is claimed by the advocates of spraying that it will kill the August crop of worms. It was also claimed that spraying with arsenites would destroy curculio in plums. Now, the same persons, after years of experience, believe the jarring process the only effective one. It may prove to be the same with spraying apple trees in August—as a sparrow does not make a summer, neither does a single experiment prove a theory.

W. A. BROWN of Benton Harbor read a paper on "Practical suggestions about picking, grading, and packing apples for market." He said, supposing you have apples to pick, the proper season is of great importance. I think the picking of apples should be about two weeks earlier than is usual. Early picking I have found to be the best. In looking after some apples left after the fair, in September, I found this fruit kept longer and better than fruit left until October. Pick before it is inclined to fall. Pick in bags or baskets, carried in the hand, and carefully pour into larger receptacles. In grading, if the crop is light, we have a lower grade; but in grading for the market there should be but two grades, while some have three or four grades. In Chicago "across-the-lake-apples" are not classed as high as those from further inland. I do not know why, unless some growers like to save everything and put small, poor fruit in the middle of the package. This is a detriment to a better class. A person who packs good fruit will, as a rule, find it will bring better prices. There may be, in marking apples, three grades—good, better, and best. Few pack best, but a grower will find it to his advantage to pack best apples, the remainder to stay at home. At Benton Harbor they utilize everything in cider mills and evaporators and they scour the country for apples for cider; but we do not drink it—it is sent to Iowa and other prohibition states! This year our evaporators had a good supply from somewhere—I do not know where. Some went to Missouri and took their machinery for evaporating with them. The apples would not come to them and so they went to the apples. Another year Missouri may have to come to Michigan. So far as utilizing the crop individually, it depends on the situation. A man who ships only a few apples is at a disadvantage. The commission men know the large shippers and he can not afford to cheat them. They also pack better, and the small packer of fruit would better keep it at home, if he can find cold storage, and wait for some one to come and buy it; and if his fruit is good he will get good prices. Cold storage can be easily built, of double walls, and the fruit kept in good order until sold. We have tried at Benton Harbor some new methods. We invite buyers from everywhere to come to Benton Harbor and buy fruit, and we find they come, more and more each year; and this plan works very well. Let them come from Chi-

cago and buy our fruit. It is better than to send it to Chicago and let them make the price. This year blackberries were scarce and buyers came in from Chicago and east and south and bid on them and we received a good price. The Chicago buyer is much better posted than the farmer, and knows when there is a scarcity. If we have a crop and there is a failure in other places, buyers will come here, and I would advise that we sell our fruit at home.

Mr. LANNIN asked if the old pear trees at Detroit were seedlings, or what they were.

T. T. LYON: I think no one knows what they are. They were first brought from France to the east part of this state. They have escaped the blight while newer trees near them were destroyed. They differ in variety and are from 150 to 200 years old. A very large number near Detroit were destroyed to make room for improvements in the city. As compared with our modern improved varieties they were inferior in size and flavor.

W. A. BROWN: Perhaps some here can inform us of varieties of early apples that are improvements on what we have. Mr. BOGUE of Batavia, N. Y., said that the Yellow Transparent is one of the best of the early apples in that region.

T. T. LYON: There are several varieties that go by the name of Yellow Transparent. They are, many of them, of high quality, that may be planted for family use; but still they may not be profitable. There are several fall apples that are superior to the Red Astrachan, but have not been used much in this vicinity. We should have better quality of apples. The Ben Davis excludes more and better fruit, as it does not encourage a taste for apple eating.

Mr. DOWD: The Primate I find an excellent apple and it has a long season.

T. T. LYON: The Primate ripens so slowly that it is not profitable. It is also somewhat given to water-core. The Strawberry is also defective in this same manner.

W. A. BROWN: The Hubbardston is the least subject, with us, to this defect, and ripens somewhat like the Baldwin. The Shiawassee has all the characteristics of the Snow. It is a beautiful apple and a leading apple with us at a high price. We have two trees in Berrien county called Orange Pippin, much resembling the Maiden Blush, but a finer fruit.

T. T. LYON: The Shiawassee was brought from Shiawassee county, from a seedling of the Fameuse, thirty years ago. The fact that so many orchards of the Fameuse were grown in the vicinity where it originated, gives a supposition that it originated from seedlings of that variety. It has not been extensively planted.

A. HAMILTON: I know an apple orchard of 200 trees near Grand Rapids that has been pulled out because the trees blighted. They were on high, good soil, and the fruit was fine. In my neighborhood, the best fall apple is the Buckingham, a large, showy apple; but we do not know if it is correctly named.

W. H. HURLBURT said, referring to an apple originating in his township, no one can name it; it is like the Red Astrachan and I would like to have Mr. RAMSDELL describe it.

J. G. RAMSDELL: It is one of the fairest and most beautiful apples, very hardy; time, October.

The society then proceeded to the election of officers with the following

result: J. LANNIN, president; R. MORRILL, first vice-president; W. A. SMITH, treasurer; W. A. TAYLOR, secretary; executive board, W. PHILLIPS, C. J. MONROE, DANIEL FALCONER, J. C. GOULD, J. B. HOUK; vice presidents, A. HAMILTON, G. H. LA FLEUR, A. C. GLIDDEN, C. A. HAWLEY.

J. C. GOULD: It has been stated that an off year would produce poor fruit, but I think that will not always account for the inferior quality. This year the weather was so warm that the sap started and was injured by souring. The leaves indicated an injury, and I think that the cause of the inferior fruit was climatic.

W. A. BROWN: I find that, notwithstanding the starting of the buds and freezing, the trees blossomed but failed to perfect the fruit. If the injury was caused by freezing, would the trees set full and then drop their fruit? In New York, we are told, the trees present this fall a blighted appearance, as if fire had run through them.

There are certain climatic conditions that will injure the tree and damage the crop. It is beyond our ken, and we shall never be able to ascertain the cause.

E. C. REID: Was there not another cause for this beyond freezing the buds? I found among the forest trees the same blighted appearance that we had on the fruit trees, and I think there was some climatic disturbance that very generally affected all trees.

A. C. GLIDDEN: I am clear that the appearance of the trees this year has been affected by some climatic disturbance that injured the trees and that it could not have been affected by spraying or any other artificial means.

E. C. REID: The belt of high ground that extends across the state on the watershed between the Grand and Kalamazoo river valleys, produced most of the fruit we had in the state this year that was good.

J. C. GOULD: Right through that region they had a snow storm that kept the ground cold, which retarded the sap, while in other places where the ground was bare the sap was affected by the warm weather.

R. MORRILL: It was stated here today, and I do not think it was fully understood, that early picked apples are better keepers and are preserved longer than the late picked ones. I think that when the seeds begin to color is the proper time to pluck the fruit.

J. C. GOULD: In Vermont I have a friend who keeps his apples in drawers, in his cool, damp cellar, and I have eaten apples kept therein that were two year old. He picked his apples very early.

Mr. LANNIN: Pears will keep better if picked before ripe, and I suppose it is the same with apples. Nature cares for the seed for reproduction, and cares nothing for the pulp surrounding it; and when the seeds turn black then is the time to gather.

R. MORRILL: The subject of cold storage is one that will cut a great figure in the keeping of apples and other fruit, and for other purposes. At the great new storehouse in Chicago, six trains of cars can stand at the platform at one time. Fifty cents will keep a barrel of apples there until the first of May, and if apples are put in in good order in September or October, they will come out in May in good condition. The temperature will not vary one degree during the season. Speculators will use it and I see no reason why farmers should not do the same thing.

W. A. BROWN: We have a cold storage house at Benton Harbor that will hold 20,000 pounds of apples and other things, and there is the place for a cold storage—at home; 950 tons of ice are used to fill it; others will

be built at other points in the state, as they are needed, for the fruit-raisers to store their products.

The evening session of Dec. 17, was opened by a paper by A. N. WOODRUFF of Watervleit, on "The Educational Influence of Horticultural Societies," which was followed by one upon "Floriculture" by Mrs. FRANK INGRAHM of Hartford. The third paper was by ROLAND MORRILL of Benton Harbor, upon

NEEDED REFORM IN GROWING AND MARKETING FRUITS.

Webster gives several definitions of the word "reform," the mildest one being, "To form again, to create, or shape anew;" and another is, "The amendment of that which is defective, vicious, corrupt, or depraved."

Evidently your secretary has concluded that everything is not just as it should be among fruitgrowers, and has assigned me this topic with a view of getting an expression of the general sentiment regarding the matter. As we hardly know which definition should be adopted, it will perhaps be best to treat the matter just as we find it, as we believe it is generally conceded that there is a chance for improvement in the business. Without going into the details of varieties, soils, etc., we will point out some defects in our work, and endeavor to indicate the remedies, and the reason why they should be promptly applied.

One of the great mistakes made by a majority of us, at the very outset, is our manner of buying nursery stock. There is an everlasting hunt for the cheapest stock; and how often we see farmers who would not plant poor, trashy seed grain at any price, but will hound all the local nurserymen for cheap trees and in the end, probably, some far-away nurseryman will make him the prices he wants and fill his order with stock that a smart commercial grower would not set if he could get a bonus for doing so. And the nurseryman can not be blamed very much, as our farmer was hunting for just such a deal. It is not necessary to go into details in this matter, as all of us have seen numerous instances of this kind; and when you find a man who is always hunting cheap stock, you always find cheap orchards, and generally find a man who thinks everybody swindles him. While it is laudable and honest to buy as cheaply as possible, we should not expect to get stock for less than it is worth; but how often we see men buy cheap nursery stock and lose \$10 to \$100 for every dollar they have saved by the operation. It usually proves untrue to name, or injured in some manner, or it may be culls, or worthless trash; but, as the buyer has paid for it, he sets it only to receive disappointment in various ways. The remedy is to buy only from reliable nurseries and get their best stock and pay a fair price for it. By the best stock, I do not mean the largest or oldest, but thrifty, young stock; and in the case of small fruit, nothing but thrifty, one-year-old plants should be used.

In the matter of culture, some of our people could make great improvement; in fact, very few of us are good cultivators. We are also very slack in fighting insects and fungi, also in trimming and thinning fruit.

After the above defects have been remedied, we get down to the very worst features in our business, which are the lack of standard, either in the package used or the manner of packing the fruit. The legislature of this state has passed an act regulating the size of the apple barrel, making it the same size as the flour barrel; but, I will venture the assertion that not one third of the farmers of this state who pack their own apples use that

size of barrel; yet I suppose the law provides a punishment for violation. Now, this alone leaves a majority of our apple-growers unpunished criminals.

So much for the legal phase of the business. As for the moral features in the case, perhaps it is best not to discuss that point, as we are becoming more and more convinced that it does not enter into the calculations of most of our growers. But let us examine it as a question of business policy, and see how it pays. The apple crop of 1889 was a large one, probably larger than in any other state, and proved to be the financial salvation of Michigan farmers. It was also one of the very best years to learn facts regarding the trade. During that summer and fall, I made it a point to learn as nearly as possible what the difference in price was between the full standard barrel and the "snide" in Chicago. I found the range of prices for the season to be \$1.25 to \$3.50 per barrel, and by inquiring at different times and of a number of dealers, I found that the amount of difference in fruit amounted to a little less than one half a bushel and the difference in the selling price was from 50 cents to 75 cents per barrel, or an average of 60 cents per barrel, after paying a slightly increased cost on the barrel. Or, in short, the Michigan grower received \$1.20 per bushel for all the extra apples required to pack full standard barrels. And further, it is the large barrel that sells promptly, while the small barrel often suffers loss, in case of a glut, by rotting down. This makes the difference still larger. The shippers in the city are the largest and best buyers, and they always want a large barrel with ten hoops and are willing to pay for it.

The same rule applies to the whole line of small fruits, as the case in common use is supposed to hold 16 quarts, but in reality holds only 14 to 14½ quarts. We frequently hear men state that they do not represent them as quarts, but only as 16 boxes. Such statements are unworthy and suspicious, and we would expect the same man to ease his conscience from any little dishonorable act by the plea that he had not promised not to do it. Again, we hear men justify themselves by saying that others do so and they have as good a right as anybody. If that man should, unfortunately, settle in a community of horse thieves, would he steal horses and justify himself in the same manner? His crime and position would be similar, only different in degree. In this manner our package manufacturers come in for a share of the blame, as they have, to a certain extent, aided in the deception by manufacturing the "snide" package. They will say that they can not control the people's wishes in the matter, and they are in the business to make anything the people want. This is to a certain extent true, but the best information we can get is to the effect that nearly every change in the size or style of package is first made by the manufacturer, and offered for our adoption, even without a demand, and we all know they are constantly making changes in the style and form of packages; and one idea seems to run through all the work, and that is to make them a little scant measure; and the majority of our farmers seem to think that a barrel is a barrel, even if it is not more than two thirds grown, and the same with a quart box. Appeals have been made time and again to the honesty and good sense of our growers to discontinue the use of such packages, and the practice of "stuffing" or dishonest packing, but so far it has accomplished but little; and I think the explanation must be in the fact that a great majority of the fruitgrowers do not attend society meetings, nor do they read papers devoted to their interest; for if they did

they would get abundant evidence that it pays to be honest in fruitgrowing and packing, for the slightest trickery is detected instantly by the shrewd buyer, and he promptly knocks off enough from the price to protect himself, and the grower has to stand it. It seems that the people of Chicago have stood about all they can of such business, and at last have passed an ordinance prohibiting dealers from offering for sale any green fruit or berries in any package except the standard barrel, bushel, or aliquot part of a bushel, according to the table of dry measure, and another section provides that all packages of green, dried, or preserved fruit shall be of uniform quality throughout. It also provides a fine of from \$5 to \$25 for each offense. I am also informed that the state of Indiana has passed stringent laws regarding the packages and packing of fruit, and it is hoped that our legislature will pass laws that will regulate the traffic.

While some of the above laws are faulty, it is hoped that they will be amended from time to time until they force every man in the trade to be honest. When that is done it will prove the salvation of Michigan fruitgrowers by protecting us from ourselves, as we are hurrying along to our own destruction as fast as possible. I presume very few people know to what extent our trade could be extended under the rigid enforcement of such laws, but every man at all familiar with the fruit trade in Chicago must know something of the distrust and disgust which consumers have for fruit from certain localities, on account of the frauds practiced in packages and packing. If that element of uncertainty can be replaced by the confidence and certainty of absolute municipal control of the business, the sale of our fruits would be far more satisfactory and would rapidly increase, the trash would be left at home where it belongs, prices would be far better, the percentage of expenses would be less, and the trade much more satisfactory all around.

It is a sad commentary on the intelligence and honesty of our fruitgrowers, that laws and ordinances have to be passed to protect our customers and compel us to do that which is evidently to our interest to do without compulsion. But it seems to be the only way, and we would suggest that, as we have all the winter before us, we lay our plans to conform with the ordinance and call the attention of the package manufacturers and local papers to the same, and let us hope that not a single man will go from here and attempt, by any means, to evade such a just ordinance; but if any man does, and is caught, he should not have the sympathy nor aid of any decent grower on the shore.

We presume a great many of us have become tired of the advice to organize for mutual benefit in selling our products, but, sooner or later, we will be forced to do so as a matter of self-preservation, unless some radical changes are made.

We are aware that the lack of some standard in package, and of packing, has been an obstacle that appeared insurmountable in attempts to organize; but, as Chicago is our main market, the above ordinance may help us to overcome that obstacle. However that may be, it has been evident to our best informed men for a long time that there is a great need of some strong organization among growers for the purpose of marketing our immense crops judiciously and economically, and unless we soon reach a point where we can combine harmoniously and intelligently we will certainly find ourselves growing fruit without profit.

J. G. RAMSDELL: Mr. MORRILL's paper was a good lesson for us in the

marketing of fruit. We all make mistakes, but some do not try to rectify their mistakes when it comes to prepare fruit for market.

It will always pay to pack it properly and send to market for what it is worth. Many fruitgrowers pack their fruit to their own ruin by putting in poor fruit, thinking it will not be noticed, and care little how they put their fruit upon the market. I think this is working more injury to fruit-growing than any one thing.

MR. LANNIN: I remember, in my own experience, some fruit goes to Chicago that we would not care to own. A few years ago I had thirty acres of peaches and I had some fine fruit, among it some Susquehannas. Three of them would fill the bottom of a peck basket, and I was so afraid it would harm the large ones by pressure that I put in a few small ones to fill up and preserve the others. I shipped to Mr. Burnett and they were sent back. It is easier to say amen in a prayer-meeting than to pack only our best fruit. We send inferior fruit, but I have found it does not pay. Although we may send more of it we do not get so much money for it. Let us be honest in sending the full measure. The people of Chicago can not be fooled any longer, so let us be honest.

J. C. GOULD: Some one has remarked that a small portion of the fruit-growers belong to our societies, and how to reach them is the question. Fruitgrowers always like to tell when they have a good thing, that their neighbors may rejoice with them.

E. C. REID: It is an error to assume, as some of the speakers have, that men stay away from these meetings because they can learn of them through the papers. My experience is that those who do not go to meetings do not take the papers and do not learn the best ways and modes of growing and handling fruit. They are unprogressive in both respects.

A. H. BROWN: Many of the fruitgrowers in my vicinity are Dutch and Irish and do not go to our meetings and do not take the papers. How are we going to reach them? We can not deceive the people of Chicago any longer. They call it "over the lake stuff," Michigan apples. "How do you know they are Michigan apples?" "Why, they are small barrels." We must reach them by our societies. If the people of Chicago will enforce their ordinances and compel the shippers to send honest fruit honestly packed, then we shall have better prices.

R. MORRILL: All I know about Indiana law is that one of the commission men in Chicago told me "Our orders from Indiana dealers are being countermanded, for they have a new law compelling the people of that state to use full packages." Michigan should pass a similar law to protect us against ourselves. I do not need it. If I see a dollar and a half dollar before me, I do not need an enactment for me to take the dollar.

A. HAMILTON: I fully indorse what Mr. MORRILL has said. I would be glad to see our people use full measures, and if they do not pack honestly they should be made to. But I deny the assertion that fruitgrowers are dishonest. I do not like to hear it charged against them. Not a word has been said about the commission men of Chicago, and reports of this meeting would show that the shippers are charged with all the dishonesty and the commission men none, and I don't believe it.

W. A. BROWN: We all know that there are dishonest practices on both sides. Is there not some way to show that dishonest practices are a detriment, not only to themselves but to all others? I think we should have a union or combination that shall have a brand on the fruit, that will be a guaranty of its quality. If we ever have fair, honest dealing we must

have an organization to control the shipments. In Delaware they had such an organization and we also had one at Benton Harbor, but some who stayed outside of the exchange, to save the one cent commission, finally broke it up by their sheer selfishness; but this was finally a damage even to the outsiders. We are doing missionary work and we find it hard to make people honest by that means. We know those people are dishonest over there, and they think we are dishonest over here, and so it goes until we have some practical way out of it.

J. C. GOULD: Some commission men keep "snide" packages and repack the fruit we send them. Now, we have a fruitgrowers' organization at Lawton. The members are intelligent and honest and they demanded last fall that the buyers come to us and buy our fruit and they came. They even went to meet the fruitsellers out of town, so anxious were they to buy of them.

D. W. HINMAN: I find the complaints come from men who pack dishonestly and then blame those who are honest and get more for their fruit. I think the time spent in thinning pays, and if the trees are properly thinned we shall have little poor fruit.

J. G. RAMSDALL: I have had some experience in "snide" packages. In filling orders I have had to buy some peaches of friends whom I thought reliable. I got some that looked all right on top, but in the bottom were some that would make a pig squeal. But in packing fruit honestly, Mr. SMITH says he sees no way except to compel people to be honest. I, at South Haven, with others, tried to get up an organization requiring the members to put their names on the package guaranteeing the fruit, and out of the seventy-five or eighty fruitgrowers we could get only fifteen to enter into such an organization. If we could get packers to put their names on the package, as a guaranty of quality, the fruit would be as sure and stable as flour, and it would sell for a full price.

R. MORRILL: I think it is not policy to smooth this matter over. It is for our credit and profit to keep working at this business until we can work a reformation. In regard to repacking in Chicago, it is thought to be discreditable, and all the larger dealers will have nothing to do with it. There is a necessity for organization among fruitgrowers. We at Benton Harbor had once a spasm of honesty, and forty-five men agreed to use standard packages. But not all filled the agreement, and it fell through. Lawton grapes were good, and they have not been in the business long enough to be spoiled yet; but if they follow precedent they will soon come to it. I do not think our fruit-men realize how much fruit could be used if all our fruit was standard. There is a demand for second-grade, but this can be standard. Each has its place. If not standard there is an element of uncertainty. One man says he has had no trouble with commission men, and I will wager that it began with himself sending perfect fruit. Now when you find men who are saying all commission men are thieves, you may depend that the fault is at home.

At the morning session of Dec. 18, reports of secretary and treasurer, and of the committee on president's message, were read. The latter precipitated a debate as to the meaning of one clause which appeared to favor an allotment of space for the use of this society, in which all the speakers took the ground that it must be purely a Michigan exhibit and not for any particular society. On motion, the clauses of the report referring to it were stricken out and the report adopted as amended.

E. C. REID moved that two members of this society be selected to act

with the legislative committee of the state society. C. J. MONROE and J. C. GOULD were selected. On motion, R. MORRILL was added to this committee. The committee on resolutions reported in the usual style and the resolutions were adopted.

QUESTION BOX.

Can gooseberry-growing be made profitable in this vicinity?

J. G. RAMSDELL: The Downing rarely drops its leaf, while Smith's does sometimes. Several others, including the Industry, are hardly worth planting. It mildews badly. Drouth seems to be most severe on gooseberries and seems to affect the Downing least of all. This variety seems best far all purposes in our locality.

A. HAMILTON: The gooseberry has been in the past profitable; but now there seems to be a disposition to plant largely, and I fear it will be overdone. A few years ago crabapples were in great demand, but now the price is so low that it does not pay to ship.

J. L. HOPKINS: The supply of gooseberries is very great now but the demand is so great that if one half the land on the lake shore were planted to gooseberries there would be none too many. For variety the Downing is preferred.

J. C. GOULD: I think no fruit except pears should be picked green. It injures the market and all fruit is better ripe than green.

E. C. REID: As to the gooseberry there is a growing liking for the ripe fruit, but green gooseberries are very nice for sauce and preserving, and they can be sent even to the Rocky mountains. I have the Smith Improved, which dropped its leaves somewhat last year but is a thrifty, strong grower, with fruit of excellent quality.

W. A. TAYLOR: It makes some difference as to the soil on which the gooseberry is planted. The Houghton does well on light, sandy soil. The Downing will sometimes mildew on heavy soil.

H. CHATFIELD: I think California will take lots of our gooseberries. They can not raise them there—it is too hot. Colorado will take quantities, and it is one of the best fruits we have for canning or preserving.

Can we sell our fruit at home?

J. C. GOULD: If we are to sell our fruit at home we must have enough fruit to get buyers to come. It was about three years before we could get them to come to Lawton, but now we find we can do better than to ship it. We sell by private sale.

E. C. REID: As secretary of the State Horticultural society I have numerous inquiries as to where fruit can be bought, and the fact is that the number of buyers coming here is increasing, and, if we work the matter up judiciously, the buyers will all come and we will get better prices from the direct competition; and it is more satisfactory to sell your fruit at home and get your money.

The meeting adjourned *sine die*.

HON. JOHN M. SAMUELS,

CHIEF OF THE DEPARTMENT OF HORTICULTURE. WORLD'S
COLUMBIAN EXPOSITION.

JOHN M. SAMUELS, chief of the department of horticulture, World's Columbian Exposition, was born in the village of Burksville, Cumberland county, Kentucky, Feb. 26, 1848.

His ancestors were English, French, and German, and were among the very first settlers of Kentucky. They participated in the Indian wars and afterward became very large land-owners and were prominently identified with the interests of the state. A great-grandfather was an own cousin of GEO. WASHINGTON and was a colonel in the Continental army.

W. M. SAMUELS, the father of the subject of this sketch, moved to Clinton, in the western part of Kentucky, in 1852, and after merchandising a few years, sold out and concentrated his efforts in the nursery business.

Young SAMUELS grew up in his father's nursery and imbibed a great love for horticulture in its various branches. When not assisting his father he attended Clinton academy, and afterward completed the college course at Kentucky university.

By testing all fruits before recommending them, and by strict attention to every detail of the business, the father and son made an excellent reputation for the Mississippi Valley nurseries, which are now known throughout the civilized world.

On arriving at his majority, in 1869, Mr. SAMUELS established the Louisiana nurseries, which are still in successful operation in Shreveport. Under his management, in those years, these nurseries became the largest in the south, and many of the large orchards and ornamental grounds in the southwest are the result of trees and plants distributed from them.

Yellow fever having almost depopulated Shreveport in 1873, Mr. SAMUELS disposed of his interests there, returned to Kentucky, and became an equal partner with his father in the Mississippi Valley nurseries, which interest he now holds.

By diligent application to business he accumulated considerable capital and invested in improved and unimproved lands in Kentucky, Tennessee, Mississippi, Florida, California, and in real estate in Chicago.

Upon the southern lands he established orchards of fruits suited to different soils and climates.

Having a desire to become familiar with fruits in all parts of the country, he adopted the best plan of doing so, by speculating in them during the least busy season in the nursery.

He bought and shipped apples, pears, grapes, etc., from New York, Michigan, Missouri, Canada, and other fruit centers; and dealt in oranges and other sub-tropical fruits, eight winters in Florida and five seasons in California. During part of this time he was a partner in a fruit commission firm in St. Louis and Chicago and had an excellent opportunity of learning the market value of foreign and domestic fruits.

For the purpose of experimenting and investigating, he has visited every state and territory in the United States, except Alaska and North Carolina, and also visited several states in Mexico and the dominion of Canada.

He has also traveled over fourteen countries in Europe, and by steady application made himself master of the details of scientific horticulture at home and abroad. Information gained in his journeyings through southern Italy, in regard to gathering, packing, and curing lemons, was communicated to the orchardists of Florida and California, was gratefully acknowledged by many of the growers in these states, and greatly stimulated that important industry.

The nursery firm of which he is a member was a large exhibitor at New Orleans and was awarded thirty-five premiums and five gold and silver medals. It is doubtful if any firm in the country has won more prizes in exhibitions north and south.

Mr. SAMUELS has been identified with many horticultural societies; has written numerous articles for the horticultural press, and edited a number of catalogues.

He is a life member of the American Pomological society, one of the vice-presidents of the American Horticultural society, member of the society of American Florists, charter member of the Horticultural society of Chicago, etc. He has the friendship and confidence of the best people wherever he has done business.

The *American Garden* of New York, in the October number, 1891, has the following editorial:

"J. M. SAMUELS has orchards and other horticultural interests in several states, north and south, and is a successful business man. There is every reason, therefore, to regard him as a cosmopolitan and representative man, one who will know no sectionalism, no partisanship, no devotion to a particular product as a main feature. We congratulate the horticultural world on this appointment, which is promising for good results."

LIFE MEMBERS OF THE STATE HORTICULTURAL SOCIETY.*

NAME.	P. O. ADDRESS.	COUNTY.
Adams, H. Dale	Galesburg	Kalamazoo.
Adams, Mrs. H. Dale	Galesburg	Kalamazoo.
Allis, E. W.	Adrian	Lenawee.
Allis, Miss Mary C.	Adrian	Lenawee.
Archer, Thomas	St. Joseph	Berrien.
Armitage, James	Monroe	Monroe.
Arnold, W. D.	Ionia	Ionia.
Avery, C. P.	Old Mission	Grand Traverse.
Bagley, John J. (deceased)	Detroit	Wayne.
Bailey, L. H.	South Haven	Van Buren.
Bailey, L. H., jr.	Ithaca	New York.
Baldwin, H. P.	Detroit	Wayne.
Baldwin, J. D.	Ann Arbor	Washtenaw.
Ball, John (deceased)	Grand Rapids	Kent.
Barnett, G. W., 159 South Water street	Chicago	Illinois.
Bates, T. T.	Traverse City	Grand Traverse.
Baxter, W. J. (deceased)	Jonesville	Hillsdale.
Beal, W. J.	Agricultural College	Ingham.
Becker, Albert J.	Saginaw	Saginaw.
Bidwell, H. E.	Plymouth	Wayne.
Blodgett, D. A.	Grand Rapids	Kent.
Brackett, G. B.	Denmark	Iowa.
Bradfield, Edward (deceased)	Ada	Kent.
Bragg, L. G.	Kalamazoo	Kalamazoo.
Bruchner, George W.	Monroe	Monroe.
Bryant, C. T.	South Haven	Van Buren.
Bullock, R. D. (deceased)	Jackson	Jackson.
Burham, W. P.	Ionia	Ionia.
Burrows, George L.	Saginaw City	Saginaw.
Caie, Robert	Yarmouth	Nova Scotia.
Castello, George	Saginaw City	Saginaw.
Chandler, Z. (deceased)	Detroit	Wayne.
Chapman, H. B. (deceased)	Reading	Hillsdale.
Chapman, Alvin	Bangor	Van Buren.
Chapman, Austin B.	Rockford	Monroe.
Chilson, Nathaniel	Tower City	Dakota.
Chilson, Miss Ida	Tower City	Dakota.
Clark, M. W.	Jackson	Jackson.
Cook, A. J.	Agricultural College	Ingham.
Cook, W. N.	Grand Rapids	Kent.
Cooley, Elisha (deceased)	Jackson	Jackson.
Cooper, George S.	Ionia	Ionia.
Crosby, M. S.	Grand Rapids	Kent.
Crozier, A. A.	Washington	D. C.
Curtis, H. W.	Old Mission	Grand Traverse.
Cushman, E. H.	Euclid	Ohio.

* NOTE.—A Life Membership is \$510. The fund thus gathered is invested in good securities and only the interest employed for general purposes.

NAME.	P. O. ADDRESS.	COUNTY.
Davis, P. C.	Kalamazoo	Kalamazoo.
Day, Benjamin	Ann Arbor	Washtenaw.
Dean, A. J.	Adrian	Lenawee.
DeLisle, Wm. H.	Bay City	Bay.
Dickinson, G. W. (deceased)	Grand Rapids	Kent.
Dieckman, Mrs. Josephine M.	East Saginaw	Saginaw.
Detrich, C. J.	Chicago	<i>Illinois.</i>
Dixon, A. S.	East Saginaw	Saginaw.
Dorr, S. W.	Manchester	Washtenaw.
Doyle, Thomas	Monroe	Monroe.
Dyckman, A. S.	South Haven	Van Buren.
Dykman, J.	East Saginaw	Saginaw.
Edmiston, D. G.	Adrian	Lenawee.
Ferry, D. M.	Detroit	Wayne.
Ferry, T. W.	Grand Haven	Ottawa.
Fields, Miss Jennie E.	East Saginaw	Saginaw.
Flowerday, Robert	Detroit	Wayne.
Foster, W. D. (deceased)	Grand Rapids	Kent.
Foster, Mrs. Mary E.	Ann Arbor	Washtenaw.
Fowler, S. W.	Manistee	Manistee.
Fuller, S. L.	Grand Rapids	Kent.
Fuller, S. R.	Eaton Rapids	Eaton.
Garfield, Chas. W.	Grand Rapids	Kent.
Geddes, David	Saginaw	Saginaw.
Gibson, Mrs. W. K.	Jackson	Jackson.
Gilbert, John (deceased)	Ovid	Clinton.
Graham, Elwood	Grand Rapids	Kent.
Greening, J. C.	Monroe	Monroe.
Griggs, George W. (deceased)	Grand Rapids	Kent.
Guild, E. F.	East Saginaw	Saginaw.
Hall, Frederick (deceased)	Ionia	Ionia.
Hanford, H. P. (deceased)	Bristol	<i>Indiana.</i>
Hannah, Perry	Traverse City	Grand Traverse.
Hathaway, B.	Little Prairie Ronde	Cass.
Haviland, J. B. (deceased)	Traverse City	Grand Traverse.
Hayden, Mrs. H. A.	Jackson	Jackson.
Humphrey, J. W.	South Haven	Van Buren.
Husted, James D.	Vineyard	<i>Georgia.</i>
Husted, Noah P.	Lowell	Kent.
Ilgenfritz, I. E.	Monroe	Monroe.
Ilgenfritz, C. A.	Monroe	Monroe.
Ives, Caleb	Monroe	Monroe.
Jerome, Mrs. David H.	Saginaw City	Saginaw.
Johnson, William	Vassar	Tuscola.
Kedzie, R. C.	Lansing	Ingham.
Kelsey, E. P.	Ionia	Ionia.
Kidd, J. H.	Ionia	Ionia.
Klein, F. J., 156 St. Aubien ave.	Detroit	Wayne.
Knapp, S. O. (deceased)	Jackson	Jackson.
Knapp, E. U.	Grand Rapids	Kent.
Knisely, A. J.	Benton Harbor	Berrien.
Lawton, George W. (deceased)	Lawton	Van Buren.
Lincoln, L. C.	Greenville	Montcalm.
Lincoln, Mrs. L. C.	Greenville	Montcalm.
Linderman, Harvey J. (deceased)	South Haven	Van Buren.
Linderman, A. T.	Whitehall	Muskegon.
Littlejohn, F. J. (deceased)	Allegan	Allegan.
Loomis, P. B.	Jackson	Jackson.
Lyon, T. T.	South Haven	Van Buren.
Mann, S. B.	Glenwood	<i>Florida.</i>
Marshall, Wm. A.	Old Mission	Grand Traverse.

NAME.	P. O. ADDRESS.	COUNTY.
Mason, L. M.	East Saginaw	Saginaw.
Mason, Mrs. Sarah A.	East Saginaw	Saginaw.
McCallam, E. H.	Lansing	Ingham.
McClatchie, G. C.	Ludington	Mason.
McDiarmid, James D.	Bear Lake	Manistee.
McNaughton, Robert T.	Jackson	Jackson.
Mitchell, W. H. C.	Traverse City	Grand Traverse.
Moore, J. H.	Lansing	Ingham.
Monroe, C. J.	South Haven	Van Buren.
Monroe, Judge (deceased)	Lawrence	Van Buren.
Montague, A. K.	Traverse City	Grand Traverse.
Nabors, Nellie S.	Flint	Genesee.
Nichols, W. W.	Ann Arbor	Washtenaw.
Noble, W. A.	Monroe	Monroe.
Odell, Samuel W.	Muskegon	Muskegon.
Palmer, Thomas W.	Detroit	Wayne.
Parmelee, George (deceased)	Old Mission	Grand Traverse.
Parmelee, Mrs. George (deceased)	Old Mission	Grand Traverse.
Parke, Mrs. Amos S.	East Saginaw	Saginaw.
Parsons, Philo	Detroit	Wayne.
Partridge, B. F.	Bay City	Bay.
Pearsall, S. M.	Grand Rapids	Kent.
Perry, George L.	Lansing	Ingham.
Petty, Thomas	Spring Lake	Ottawa.
Pierce, N. B.	Ludington	Mason.
Potter, E. M.	Manderson	Nebraska.
Ramsdell, J. G.	Traverse City	Grand Traverse.
Ramsdell, Mrs. J. G.	Traverse City	Grand Traverse.
Ransom, W. D.	St. Joseph	Berrien.
Renwick, T. R.	Grand Rapids	Kent.
Reynolds, E. H.	Monroe	Monroe.
Reynolds, H. G.	Agricultural College	Ingham.
Rich, Hampton	Ionia	Ionia.
Root, Amos	Jackson	Jackson.
Rose, D. Forsyth	East Saginaw	Saginaw.
Rose, Mrs. Sophie E.	East Saginaw	Saginaw.
Rowe, William	Grand Rapids	Kent.
Rowe, William N.	Grand Rapids	Kent.
Russell, Dr. Geo. B.	Detroit	Wayne.
Rust, C. E.	Ionia	Ionia.
Satterlee, James	Albany	New York.
Savidge, Hunter (deceased)	Spring Lake	Ottawa.
Scott, J. Austin	Ann Arbor	Washtenaw.
Scott, Dr. Austin	Newark	New Jersey.
Scott, E. H.	Ann Arbor	Washtenaw
Sessions, Charles A.	Mears	Oceana.
Sessions, Alonzo (deceased)	Ionia	Ionia.
Sessions, William	Ionia	Ionia.
Shirts, E. J.	Shelby	Oceana.
Shoop, Rev. D. R.	Hastings	Barry.
Sinclair, W. G.	Grand Rapids	Kent.
Sigler, Artimus	Adrian	Lenawee.
Slayton, Asa W.	Grand Rapids	Kent.
Sleeper, F. S. (deceased)	Galesburg	Kalamazoo.
Smith, E. T.	Ionia	Ionia.
Smith, N. E.	Ionia	Ionia.
Smith, H. H.	Jackson	Jackson.
Soule, J. B.	Fruitport	Muskegon.
Staunton, G. W.	Grand Rapids	Kent.
Stearns, J. N.	Kalamazoo	Kalamazoo.
Stearns, Ida L.	Kalamazoo	Kalamazoo.

NAME.	P. O. ADDRESS.	COUNTY.
Steere, B. W.	Adrian	Lenawee.
Sterling, F. S.	Monroe	Monroe.
Sterling, J. M.	Monroe	Monroe.
Sterling, J. C. (deceased)	Monroe	Monroe.
Sterling, W. C.	Monroe	Monroe.
Sterling, W. P.	Monroe	Monroe.
Sterling, Mrs. Emma M.	Monroe	Monroe.
Stockbridge, F. B.	Kalamazoo	Kalamazoo.
Suttle, John (deceased)	Grand Rapids	Kent.
Taylor, George	Kalamazoo	Kalamazoo.
Taylor, George C.	Kalamazoo	Kalamazoo.
Thomas, H. F.	Jackson	Jackson.
Thompson, W. D.	Jackson	Jackson.
Thompson, J. P. (deceased)	Detroit	Wayne.
Towles, George W. (deceased)	Benton Harbor	Berrien.
Tracy, Will W.	Detroit	Wayne.
Vick, James (deceased)	Rochester	New York.
Vick, James, jr.	Rochester	New York.
Vick, Frank H.	Rochester	New York.
Vick, Charles H.	Rochester	New York.
Vick, E. Colston	Rochester	New York.
Wadsworth, W. R.	Lapeer	Lapeer.
Waite, Gilbert M.	Paw Paw	Van Buren.
Walker, S. S.	St. Johns	Clinton.
Watkins, L. D.	Manchester	Washtenaw.
Webber, William L.	East Saginaw	Saginaw.
Webber, George W.	Ionia	Ionia.
Webber, Miss Frances E.	East Saginaw	Saginaw.
Wells, H. G. (deceased)	Kalamazoo	Kalamazoo.
Whittlesey, John	St. Joseph	Berrien.
Wier, Antoine	Monroe	Monroe.
Wilde, Thomas	Herrington	Ottawa.
Williams, S. P.	Monroe	Monroe.
Winchester, A. O.	St. Joseph	Berrien.
Wooding, Charles F.	Lowell	Kent.
Woodward, David	Clinton	Lenawee.
Wurtz, Elias H.	East Saginaw	Saginaw.
Zeigler, J. C.	Saginaw City	Saginaw.

FRUIT CATALOGUE

OF THE

MICHIGAN STATE HORTICULTURAL SOCIETY

FOR

1891-2.

FRUIT CATALOGUE, 1891-2.

PREFATORY REMARKS.

In submitting the sixth revision of the Society's Catalogue of fruits, we take occasion to remark—

That several of the varieties included in the earlier revisions had so fallen into disuse that they were omitted, and continued only in a rejected list, without description or characterization.

In the present revision, a few additional varieties are transferred to the rejected list; while descriptive or characterizing words, whose signification is given in the descriptive columns, are eliminated from the names of fruits, together with the apostrophe s, as indicative of possession.

The chairman is again compelled to state that he has been compelled to act almost wholly from his personal knowledge of the distribution and success of varieties; a circumstance greatly to be regretted, since there is little room for doubt that full reports from the several districts would have supplied facts of great value to those who may have occasion to make selections from the catalogue.

The following persons are members of the committee to collect material for use in the next revision, to either of whom information may at any time be communicated:

- 1st District—L. B. Rice, Port Huron, St. Clair county.
- 2d " —Ewart H. Scott, Ann Arbor, Washtenaw county.
- 3d " —D. G. Edmiston, Adrian, Lenawee county.
- 4th " —W. A. Brown, Benton Harbor, Berrien county.
- 5th " —Geo. C. McClatchie, Ludington, Mason county.

Each member is local chairman for his district, and is required to appoint three or more associates as aids in the collection of material for the next revision.

Such appointments should be promptly made, so that the collections may be commenced, and the desired information when obtained should be promptly transmitted to the general chairman.

T. T. LYON,

Chairman of Com. on Revision of Catalogue.

SOUTH HAVEN. January, 1891.

PLAN OF THE CATALOGUE.

The varieties are numbered at the extreme left, and also at the left of the page occupied by the column of remarks, to avoid confusion in tracing the connection. Synonyms are introduced in a few cases only, and *italicized*. In the case of names deemed objectionable, under the rules of the American Pomological Society, to avoid the possibility of ambiguity, the objectionable portion of the name, when needful, is placed in brackets. In the column devoted to descriptions, the distinguishing peculiarities of the fruit, with its season and origin, are more or less fully given by the use of abbreviations; those applicable to the entire catalogue appearing at its commencement, and those applying locally at the heads of the sections to which they appertain. In each of the sub-columns headed use and value, the figures 1 to 10

express the gradations of value, *for the purpose to which the column is devoted*; the first two sub-columns (devoted respectively to dessert and cooking fruits), having reference, strictly, to the quality of the fruit separately considered; and the third or market column, *to all the qualities, whether of tree or fruit*, that affect the question of profitability. Under the head of locality, a sub-column is assigned to each of the five districts into which the Lower Peninsula of the state is divided, such divisions being as follows, viz.: 1st district, the eastern tier of counties, from the southern boundry of the state northward as far as its capacity for fruit culture is known; 2d district, the mass of interior counties, omitting the tier along the southern boundary, and those adjoining Lake Michigan; 3d district, the southern tier of counties, omitting Monroe on the east and Berrien on the west; 4th district, the lake shore counties from the south line of Berrien northward to and including Muskegon county; 5th district, the counties adjacent to Lake Michigan and its bays, from the north line of Muskegon county, as far northward as their capacity for fruit culture is known. In these columns a * indicates that the variety which it represents is known to succeed in the district; ** that it is especially valuable, and a † that it is on trial and found promising. With the settlement of northern Michigan, and consequently increased knowledge of its horticultural capacities, at least three additional districts will be required; one extending from Bay county northward, along the westerly shore of Lake Huron; the second embracing the northerly portion of the present second or interior district, and the third including the Upper Peninsula; which, moreover, may, very probably, require a farther division into eastern and western districts.

In the column headed "Use and Value," the gradations are arrived at by comparing fruits of a similar character with each other, as sweet apples with sweet apples; also fruits of a given season with others of the same class and season. Many kinds of very little value are added, for the purpose of showing by the low values given them, and by remarks in the column for that purpose that, though more or less grown in the state, their farther cultivation is not intended to be encouraged. The leading advantage to the fruit culturists of the state, sought in this catalogue, is to supply all who may wish to plant with a distinct purpose in view, the means of selecting wisely, with reference to such purpose, from the varieties which have been properly tested in the state, and found best adapted to the special purpose they shall have in view.

NOMENCLATURE.

The nomenclature adopted is that of "Downing's Fruits and Fruit Trees of America"—latest edition; modified in compliance with the catalogue of the American Pomological Society, and its Rules of Pomology.

We have, in very many cases, in which redundant terms are retained by the revisors of the American Society's Catalogue, and in which present popular practice already indicates a tendency toward their elision, included the redundant or objectionable words in brackets, hoping thus to encourage the popular tendency in what may be considered a safe and proper direction.

SEASON OF MATURITY.

The season of maturity given is, as nearly as practicable, that of the second and third tiers of counties, reckoning from the south line of the state.

FRUIT CATALOGUE FOR 1891 AND 1892

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ABBREVIATIONS, APPLICABLE THROUGHOUT THE CATALOGUE.

Size.	Quality.	Adhesion.
l. large.	b. best.	c. cling.
m. medium.	g. good.	f. free.
s. small.	v. very.	
v. very.		

SECTION I.—APPLES.

ABBREVIATIONS FOR THIS SECTION.

Form.

a. angular.	o. oblong.
c. conical.	ob. oblate or obtuse.
f. flattened.	ov. oval or ovate.
l. lop sided or oblique.	r. roundish.

Number.	Names.	Description.						Use and Value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Season.	Origin.	Dessert.	Cooking.	Market.
1	Alexander	v l	r c	g y r	g	Oct. Dec.	Rus.	2	10	6
2	American Beauty	l	r c	y d r	v g	Dec. Apr.	Mess.	7	5	6
3	American Golden	m l	r o b c	y b	v g	Nov. Feb.	Am.	7	7	7
4	American Golden Russett	s	r o v	y r u	b	Oct. Jan.	Am.	9	6	2
5	American Pippin, <i>Grindstone</i>	m	o b	g r b	g	Dec. Dec.	Am.	1	6	2
6	Anglo-American	m	o b	y r	v g	Aug. Sept.	Can.	7	5	3
7	Autumn Swaar	l	r c	o y r u	v g	Sept.	Am.	7	7	5
8	Autumn Sweet Swaar	m	c o b	y r	v g	Oct.	Am.	5	5	2
9	Autumn Bough	m	c a	y	v g	Aug. Oct.	Am.	5	5	2
10	Bailey Sweet	l	r c	y d r	v g	Nov. Mar.	N. Y.?	6	7	4
11	Baldwin	l	r c	y c r o	v g	Nov. Mar.	Mass.	6	9	10
12	Beauty of Kent	l	r f c	g y p r	g	Oct. Nov.	Eng.	5	8	7
13	Belle et Bonne	v l	r o b	y	g	Oct. Mar.	Conn.	2	8	6
14	Belmont	m	r f c	y v	v g	Nov. Mar.	Penn.	9	5	7
15	Ben Davis	m l	r c	y r	g	Dec. May.	Ken.?	3	5	9
16	Benoni	m s	r o b c	y d c	v g	Aug. Sept.	Mass.	7	6	6
17	Bentley Sweet	m	r f l	y g r	v g	Jan. May.	Vir.?	4	6	3
18	Black Gilliflower	m	o c	g d r	g	Nov. Feb.	Am.	4	2	4
19	Blenheim Pippin	l	r o b c	y o d r	g	Oct. Dec.	Eng.	5	9	8
2	Blue Pearmain	l	r c	d p r	g	Oct. Feb.	Am.?	6	5	5

FRUIT CATALOGUE FOR 1891 AND 1892.

ABBREVIATIONS APPLICABLE THROUGHOUT THE CATALOGUE.

Season.		Origin.	
The usual abbreviations for months.	b. beginning. e. end. m. middle.	The usual abbreviations for countries.	h. hybrid. ? doubtful.

SECTION I.—APPLES.

Color.

b. brown.	o. orange.	v. vermillion.
c. carmine.	p. purplish.	w. whitish.
cr. crimson.	r. red.	y. yellow.
d. dark.	ru. russet.	
g. green.	s. scarlet.	

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern Lake Shore.	Northern Lake Shore.	
1	*	*	*	*	*	Tree vigorous, spreading, productive; very beautiful. For cooking, superior.
2	*	*	*	*	---	Vigorous, productive, annual bearing tree. Sometimes small and scabby from overbearing.
3	*	*	*	---	---	An old sort. Superior to many that are better known.
4	*	*	*	*	*	Better farther south. Tree upright. Fruit often scabby and worthless.
5	*	*	*	*	*	Keeps a year. Cooks well, but otherwise scarcely eatable.
6	*	---	---	---	---	Tree vigorous, productive. Sweet apples are little wanted at this season.
7	*	*	*	*	---	Hardy, vigorous, spreading. Excellent, but not productive enough for the market.
8	*	---	---	---	---	Tree and fruit desirable, but coming in with the bulk of the fall fruits lessens its value.
9	*	---	---	---	**	One of the best dessert sweet apples of the season.
10	*	*	*	*	*	For vigor, productiveness, size, beauty and quality combined, this has few if any superiors.
11	**	**	**	**	*	Tree lacks hardiness. Fruit drops badly. Bitter rot in large specimens. Stands first on light soils in southern Michigan.
12	*	*	*	*	*	An old culinary fruit,—now nearly superseded.
13	*	---	---	---	---	A vigorous and productive old New England apple. Little known here, and not valued where known.
14	*	**	*	*	*	Fruit often defective in this climate. Best for home markets. Suits the popular taste.
15	*	*	*	*	*	Vigorous, hardy, prolific. Fruit beautiful and handles well, but very poor in quality. Sells well in the market.
16	*	*	*	*	*	Tree upright, vigorous, very productive. Fruit too small on old trees.
17	*	---	---	---	---	Tree grows and bears moderately. Not generally known or highly valued.
18	*	*	*	*	*	Very mild flavor. Soon gets dry and mealy. Prized by a very few persons.
19	*	*	*	*	---	In vigor and productiveness, also character of fruit, this is very desirable for market and cooking.
20	*	*	*	*	*	Beautiful; but lacks both productiveness and quality.

SECTION I.—APPLES.—CONTINUED.

Number.	Names.	Description.						Use and value. Scale 1 to 10.		
		Size.	Form.	Color.	Quantity.	Season.	Origin.	Dessert.	Cooking.	Market.
21	Bottle Greening.....	m	ob c	g y c r	v g	Jan. Feb.	Ver.	8	---	---
22	Broadwell	m	ob c	y b	v g	Nov. Feb.	Ohio.	7	7	4
23	Buckingham	m l	ob c	g y c r	v g	Nov. Feb.	Vir.?	6	7	7
24	Buffington.....	m	ob	y w r	v g	Aug.	Penn.	7	7	3
25	Burr Sweet.....	m	ob c	y r	v g	Nov. Mar.	Mass.	6	7	2
26	Cabashea, 20-oz. <i>Pippin</i>	v l	r ob c	y r	g	Dec. Feb.	Am.	1	4	1
27	Canada Reinette.....	l	ob c f	g y b	v g	Dec. Apr.	Eur.?	8	7	2
28	Chenango	m l	o c	w c	v g	Sept. Oct.	N. Y.	9	4	8
29	Clyde	l	r c a	g r	g	Oct. Jan.	N. Y.	6	7	8
30	Cogswell	m l	r ob	y r	b	Dec. Mar.	Conn.	8	7	8
31	Cole Quince	l	r ob	g y r	v g	Oct. Dec.	Maine.	6	8	6
32	Colvert	l	ob c	g y r	g	Oct. Nov.	N. Y.?	4	7	7
33	Cooper	l	r ob	g y r	g	Oct. Dec.	Am.?	4	6	7
34	Cooper Market.....	m	ob c	y r c	g	Dec. May.	Am.?	4	8	6
35	Cornell	m	o c	y c	v g	Oct. Nov.	Penn.	7	6	8
36	Cranberry Pippin	m	r ob	y s	g	Nov. Mar.	N. Y.	5	7	8
37	Cumberland Spice.....	m l	r c	y r	g	Dec. Mar.	N. J.	6	5	7
38	Danvers Sweet	m	r o	y o	v g	Nov. Apr.	Mass.	5	7	5
39	Detroit Black	m l	r c f	d c r	g	Oct. Feb.	Can.?	6	4	2
40	Detroit Red	m	r c	d c r	g	Oct. Nov.	Am.?	4	3	1
41	Domine	m	r ob	g y r	v g	Dec. Apr.	Am.?	6	6	8
42	Drap d'or.....	l	r ob	y	g	Aug. Oct.	Eur.	5	5	1
43	Dyer, <i>Pomme Royal</i>	m	r	g y r	b	Sept. Oct.	Fr.?	10	8	4
44	Early Harvest	m	r ob	y w	b	July Aug.	N. Y.?	9	9	5
45	Early Joe.....	s	ob c	y r	b	Aug. Sept.	N. Y.	10	6	4
46	Early Strawberry.....	s	r c	y r	v g	July Aug.	N. Y.	8	6	7
47	English Russet.....	s m	r c	g y r u	g	Jan. May.	Am.?	4	5	6
48	Esopus Spitzenburg.....		o c	y r	b	Dec. Apr.	N. Y.	9	10	4
49	Fallawater	v l	r c	y g r	g	Nov. Mar.	Penn.	4	4	7
50	Fall Jenetting.....	l	ob c	g y r	g	Sept. Oct.	Conn.?	5	4	4
51	Fall Orange	l	r	y r	g	Oct. Nov.	Mass.	4	8	8
52	Fall Pippin.....	v l	r f	y g b	b	Oct. Dec.	Am.	9	10	7
53	Fall Wine	m	r ob	r y	b	Sept. Nov.	Am.	8	6	1
54	Fameuse, <i>Snow</i>	m	r ob	g y r	v g	Oct. Nov.	Can.?	9	4	6
55	Flower (of Genesee)	l	r	y g w	g	Oct. Nov.	N. Y.?	4	4	6

SECTION I.—APPLES.—CONTINUED.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern Lake Shore.	Northern Lake Shore.	
21	*	*	*	*	*	Vigorous, spreading. Little grown in this State.
22	*	*	*	*	*	Vigorous, hardy, spreading, irregular, productive. A desirable sweet apple.
23	*	---	*	*	---	Little grown here. More popular farther south.
24	*	---	---	---	---	A desirable dessert apple. Not as generally known as it deserves to be.
25	*	---	---	---	---	Good grower, early bearer, productive. But little known.
26	*	*	*	*	*	Tree vigorous; tender; thin bearer; drops badly. Poor quality. Subject to bitter rot.
27	*	*	*	*	---	An old and often excellent apple; but now little called for.
28	*	*	*	*	*	Tree vigorous, spreading, productive. Fruit of very delicate texture. Popular wherever known.
29	*	*	*	*	---	Tree vigorous, upright, very productive. A desirable market apple.
30	*	*	*	*	---	The tree and fruit are both satisfactory, whether for the home or market.
31	*	---	---	---	---	Upright, spreading, productive. A desirable family fruit with a quince aroma.
32	*	*	*	*	*	Tree vigorous, hardy, prolific. Fruit large, showy, but not of high quality.
33	*	*	*	*	*	Popular with the masses. Sells well in market.
34	*	*	*	*	*	Tree very vigorous, upright, spreading. Fruit even sized, very attractive.
35	*	*	*	*	*	Hardy, vigorous, upright, productive. Profitable.
36	*	*	*	*	*	Vigorous, productive. A desirable fruit for general purposes.
37	*	*	*	*	*	Tree a good grower, productive. Fruit much like the Maiden's Blush. Even more beautiful. Worthless at the extreme north.
38	*	*	*	*	*	Tree a good grower and great bearer. Its color and season are against it for the market.
39	*	*	*	*	*	Strong grower and very productive. Deserves more attention.
40	*	*	*	*	*	Unproductive, showy, valueless. This is probable the Detroit Red of Downing.
41	*	*	*	*	*	There are probable several varieties grown under this name. None of them valuable.
42	*	*	*	*	*	Tree has long, stout, spreading branches, which are very liable to be broken by the heavy crops of fruit. Scabs on old trees.
43	*	*	*	*	*	Tree straggling, moderate grower, unproductive. Very little known.
44	*	*	*	*	*	One of the very finest desert apple. A poor grower. Unprofitable as a market fruit.
45	*	*	*	*	*	Tardy, irregular bearer. Fruit often imperfect. Valued mainly for its earliness. Fails on old trees.
46	*	*	*	*	*	For the garden. With high culture the fruit is beautiful and excellent.
47	*	*	*	*	*	One of the most attractive dessert apples of its season. Ripens in succession, by some considered profitable.
48	*	*	*	*	*	Strong, upright, very productive, tender. Fruit very even sized, often small. Keeps easily a year. Poor quality.
49	*	*	*	*	*	Tree lacks vigor. Fruit much called for in the market, but rarely offered.
50	*	*	*	*	*	Best on rich, warm soils.
51	*	*	*	*	*	Grows and produces well. Too poor in quality. Size its chief recommendation. Always sells well.
52	*	*	*	*	*	Tree vigorous, spreading, productive. Its season and color detract from its value.
53	*	*	*	*	*	The apple grown in this State under this name proves to be the one grown as "Newell" in Hillsdale county.
54	*	*	*	*	*	Tree strong, spreading, productive; liable to scab. Often keeps till spring.
55	*	*	*	*	*	In central district lacks productiveness.
56	*	*	*	*	*	Grows and bears well. Fruit often scabby. Not extensively grown.
57	*	*	*	*	*	Fruit scabby and imperfect on old trees. Best on new, rich soils. Good at the north. Profitable where it succeeds.
58	*	*	*	*	*	Very productive, fruit always fair; otherwise not desirable.

SECTION I.—APPLES—CONTINUED.

Number.	Names.	Descriptions.						Use and value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Season.	Origin.	Dessert.	Cooking.	Market.
56	Flushing	m	r c	g y r	g	Nov. Mar.	N. Y.?	6	6	7
57	Foundling	m l	r o b c	y g r	v g	Aug. Sept.	Mass.	7	7	6
58	Fourth of July	m s	r o b c	w y r	g	July.	Ger.	4	6	6
59	Garden [Comstock's]	m	r o b	w r	g	Sept. Oct.	N. Y.	3	9	5
60	Garden Royal	m s	r o b c	g y r	b	Aug. Sept.	Mass.	10	5	3
61	Garrettson	m	r c	y	v g	Sept.	N. J.	8	8	8
62	Genesee	l	r c	w c r	g	Sept.	Am.	6	8	7
63	Gilpin, <i>Carthouse</i>	m	r o	r y	g	Dec. May.	Vir.	5	4	7
64	Gloria Mundi	v l	' o b	g y	g	Oct. Feb.	Eur.?	1	3	3
65	Golden Russet (W. N. Y.)	m s	s o b	y r u	v g	Dec. May.	Eng.?	9	5	10
66	Golden Sweet	l	r	g y		Aug. Sept.	Conn.	6	5	4
67	Gravenstein	l	r o b a	y r o	v g	Sept. Oct.	Ger.	7	7	7
68	Green Newtown	m	r	g b r	b	Dec. May.	N. Y.	10	8	3
69	Green Sweet	m	r o b c	g y	g	Dec. Mar.	Mass.?	7	6	7
70	Grimes Golden	m	r o b c	y o	v g	Dec. Mar.	Va.	9	7	8
71	Hartford, Sweet	l	r f	y g r	g	Dec. June.	Conn.	6	7	4
72	Haskell Sweet	m l	o b	g y r	v g	Sept. Oct.	Mass.	6	7	2
73	Hawley, <i>Dowse</i>	l	r o b c	y	v g	Sept.	N. Y.	9	2	5
74	Hawthornden	m l	r f	w y r	g	Sept.	Scotch.	3	8	8
75	Herefordshire	m	r c	y d r	v g	Nov. Feb.	Eng.	8	6	1
76	Hightop Sweet	m s	r	y	v g	Aug.	Mass.	6	6	2
77	Hog Island Sweet	m	o b	y r c	v g	Sept. Oct.	N. Y.	6	7	3
78	Holland Pippin	v l	r	g y r	g	Aug. Nov.	Eur.?	6	8	4
79	Hollow Crown	l	r c	y r	g	Nov. Dec.	N. E.	5	7	8
80	Horse	l	r	y r r u	g	Aug. Sept.	N. C.?	5	6	5
81	Hubbardston	l	r o c	y r	b	Nov. Feb.	Mass.	10	5	9
82	Hunt Russet	m s	r o b c	y r u r	v g	Jan. Apr.	Mass.?	7	7	6
83	Hurlbut	m	o b c a	y r	g	Oct. Dec.	Conn.	6	7	6
84	Indiana Favorite	m l	r f	y r	g	Jan. April.	Ind.	5	5	7
85	Jabez Sweet	m	r c	y	g	Dec. Feb.	Conn.	6	7	3
86	Jefferis	m	o b c	y c r	v g	Sept. Oct.	Penn.	9	6	7
87	Jefferson County	m	r o b	y r	g	Oct. Nov.	N. Y.	7	6	5
88	Jersey Sweet	m	r o v c	g y r	v g	Sept.	N. J.	8	7	4
89	Jewett Best	l	o b r	y g r	v g	Dec. Feb.	Ver.	8	6	4
90	Jewett Red	m	r o b	g w c r	g	Nov. Feb.	N. H.	7	6	5

SECTION I.—APPLES—CONTINUED.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern Lake Shore.	Northern Lake Shore.	
56	*	*	*	*	*	Strong, reddish brown shoots. Very productive. Sometimes scabby. Not esteemed valuable, except perhaps at the north.
57	*	----	----	----	----	Moderately vigorous, spreading, productive; desirable in its season.
58	*	----	----	*	----	Strong, upright. May be valuable for its earliness.
59	----	----	*	----	----	A fine culinary apple. Cooks well when half grown.
60	*	*	*	----	----	Moderate grower. Upright, roundish. Best desert apple of its season.
61	*	----	----	----	----	Vigorous, upright, spreading. Very promising.
62	*	*	*	*	----	Strong, vigorous. The showy fruit is the chief attraction.
63	*	*	*	*	----	A good cider apple, and passable for the table.
64	*	*	*	*	*	Vigorous; not productive. Size its only attraction. Worthless everywhere.
65	**	**	*	*	**	Hardy, vigorous. Shoots slender. Very productive. Brings a high price in late spring, if wintered in close packages.
66	*	*	*	*	*	A hardy, spreading, prolific tree. Very popular in its season. Tree tender at the extreme north. Often fed to stock.
67	*	**	*	*	*	A fine culinary fruit. Tree a fine grower and hardy; lacks productiveness. Bears better at the north.
68	*	*	*	*	*	A weak, slender grower. Fails generally at the west. Unprofitable. Best on "opening" soils.
69	*	**	*	*	----	Tree vigorous, productive. Desirable. More than one variety grown under this name.
70	*	*	*	*	*	Tree spreading, vigorous, hardy, prolific. Fruit beautiful. Flavor, fine, peculiar.
71	*	*	----	----	----	Moderate grower, hardy, productive. A good baking sweet apple.
72	*	*	*	*	**	Vigorous, productive. One of the finest of sweet apples.
73	*	*	*	*	*	Annual bearer. Fruit beautiful and good, but soon decays. A dessert fruit. A better keeper north.
74	*	*	*	*	----	Tree vigorous, spreading. Productive alternate years. A beautiful culinary market fruit.
75	*	*	*	*	----	Tree vigorous. Fruit excellent in flavor, but generally imperfect. Very unprofitable.
76	*	*	*	----	----	Tree upright, vigorous. Very productive. Fruit very beautiful and good.
77	*	----	----	*	----	Vigorous, prolific. Desirable, but very little known. Beautiful.
78	*	*	----	----	*	Like fall Pippin, except in quality and season; but not as good. Very little known.
79	*	----	----	----	----	Little planted. There are other and worthier varieties of the same season.
80	*	----	----	----	----	Should give place to others of better quality for this climate.
81	*	**	*	**	**	Should be in every orchard. A very good market variety. Of the highest quality.
82	*	*	*	*	*	Distinct from Golden Russett of N. Y., and the west. Not as valuable.
83	*	----	----	----	----	Very productive. Fruit fair, but not very attractive. Little disseminated.
84	*	----	----	----	----	Both tree and fruit adapted for market. Very little known.
85	*	----	----	----	----	Highly prized in Monroe county. Not widely disseminated.
86	*	*	*	*	*	A very productive and desirable dessert fruit for early autumn.
87	*	----	*	----	*	Vigorous, hardy, prolific. Is but little known.
88	*	*	*	*	*	Prolific. One of the richest early sweet apples. Tree tender in central districts.
89	*	----	----	----	----	Tree spreading. Does not keep long enough for profit. Little known.
90	*	----	----	----	----	Moderate grower. Downing says—requires high culture. Little known.

SECTION I.—APPLES—CONTINUED.

Number.	Names.	Descriptions.						Use and Value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Season.	Origin.	Dessert.	Cooking.	Market.
91	Jonathan.....	m s	r c	y r	v g	Nov. Feb.	N. Y.	9	7	9
92	Kaighn.....	l	o o v c	w y r	g	Nov. Jan.	N. J.	5	6	6
93	Keswick.....	m l	o v c	g y r	g	Sept. Oct.	Eng.	2	10	5
94	Klaproth.....	m	f	g y r	v g	Aug. Oct.	Penn.	7	7	4
95	Lady.....	v s	f	y r	v g	Dec. May.	Fr.	8	1	5
96	Lady Sweet.....	l	r o v c	y r	v g	Dec. May.	N. Y.	7	7	7
97	Late Strawberry.....	m	r c	w r	v g	Oct. Dec.	N. Y.	8	4	5
98	Ledge Sweet.....	m	o b	w y r	g	Dec. Mar.	N. H.	5	5	5
99	Limber Twig.....	m	r o b	y r	g	Jan. Apr.	N. C.?	5	7	8
100	London.....	l	r c f	y r	g	Nov. Feb.	Eng.	5	7	6
101	Lowell.....	l	r o v c	g y	v g	Sept. Oct.	Penn.?	7	7	8
102	Lyscom.....	l	r	g y r	g	Sept. Nov.	Mass.	7	3	5
103	Macomber.....	m	o b	y r	g	Dec. Jan.	Maine.	6	4	5
104	Maiden Blush.....	m	r f c	y r c r	g	Sept. Oct.	N. J.	6	8	10
105	Mann.....	m l	r o b	y b r	v g	Jan. Apr.	N. Y.	6	7	9
106	Manomet.....	m	r o b	y r	v g	Aug. Sept.	Mass.	7	7	4
107	Marston.....	m	r c	w y r c r	v g	Dec. Mar.	N. H.	8	7	6
108	May (Seeknofurther).....	m	o b c l	g y r	g	Feb. June.	Am.	1	1	7
109	McAfee.....	m l	r o b c	y r	v g	Oct. Feb.	Ken.	6	7	7
110	McLellan.....	m	r o b	y r	v g	Dec. Mar.	Conn.	9	7	8
111	Melon.....	m l	r o b c	y c r c.	b	Nov. Mar.	N. Y.	10	8	7
112	Mexico.....	m	r o b	e r r y	b	Sept. Oct.	Conn.	10	6	5
113	Milam.....	m s	r	g r	g	Dec. Mar.	Am.	5	6	5
114	Miller (N. Y.).....		o o b c	y r	v g	Oct. Nov.	N. Y.?	7	6	8
115	Minister.....	l	o c	g y r	g	Oct. Feb.	Mass.	6	7	5
116	Monmouth.....	l	o b c a	y r	v g	Nov. Mar.	N. J.	6	7	9
117	<i>Red Cheek Pippin.</i> Morris Red.....	m l	o v c	r r u	v g	Jan. Apr.	Conn.?	8	8	7
118	<i>Steele's Red erroneously.</i> Mother.....	m	r c	y r	b	Nov. Feb.	Mass.	7	6	7
119	Munson Sweet.....	m	o b	y r	v g	Sept. Feb.	Mass.?	6	7	7
120	Newtown Spitzenburg.....	m	o b c	y r	b	Oct. Feb.	N. Y.	9	7	5
121	<i>Vandevere of N. Y.</i> Nickajack.....	l	r o b c	y r	g	Dec. Apr.	N. C.	4	2	6
122	Northern Spy.....	l	r c	g y r	b	Dec. Apr.	N. Y.	10	9	10
123	Oakland.....	m	r o b	y r	v g	Nov. Mar.	Mich.?	8		8
124	Oconee.....	l	r f	y b	g	Nov. Dec.	Ga.	6	6	7
125	Ohio Nonpareil.....	l	r o b	y r	v g	Nov. Dec.	Ohio?	8	9	9
126	Oldenburgh.....	m	r o b	y r	g	Sept.	Rus.	5	9	9

SECTION I.—APPLES—CONTINUED.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern Lake Shore.	Northern Lake Shore.	
91	**	**	*	*	**	Good bearer alternate years. Fruit small, very beautiful, and good. Popular.
92	*	*	*	*	---	Tree vigorous, straggling, productive. Old. Now little grown.
93	*	*	*	*	*	Cooks well, even when but half grown. Very early bearer. Very hardy and prolific.
94	*	---	---	---	---	Downing commends it as a promising market apple. This remains to be shown.
95	*	*	*	*	*	A beautiful little fancy apple. Brings large prices in market in eastern cities. Little known west. Sometimes scabs.
96	*	**	*	*	*	A fair baking apple. Desirable as a long keeper. Retains its juice and flavor.
97	*	*	*	*	*	Regular, early bearer. Chenango is often grown under this name.
98	*	---	---	---	---	Vigorous, productive, regular bearer. But little known.
99	*	*	*	*	*	Popular west and south as a long keeper. Distinct from Willow Twig.
100	*	---	---	---	---	Little known, with little to specially recommend it.
101	*	*	*	**	**	Strong grower, bears heavily in alternate years. Popular. Profitable.
102	*	---	*	---	---	Generally fair. Tree vigorous, upright, spreading. Not largely planted.
103	*	---	---	---	---	Annual bearer. But little known, and not likely to command special attention.
104	*	**	*	**	**	Spreading, vigorous, prolific. The most popular early autumn market apple. Rather acid for dessert.
105	*	*	*	*	*	Hardy, upright, annual bearer. Not much disseminated. A long keeper.
106	*	---	---	---	---	Vigorous, productive. Fruit excellent. Worthy of increased attention.
107	*	---	---	---	---	Moderate grower. A beautiful and excellent fruit. Unproductive.
108	*	*	*	*	---	Vigorous. Known in Eastern Michigan as Romanite. Only valued as a long keeper.
109	*	*	*	*	---	An old Southern variety. Not widely disseminated in Michigan. Unworthy.
110	*	**	*	*	---	Thrifty, upright, productive. An excellent variety for home and market. Bears alternate years.
111	*	**	*	*	---	One of the very best dessert apples. Tree hardy, with short, wiry shoots. Very productive alternate years.
112	*	*	*	---	---	Moderate grower, hardy, productive. One of the finest of dessert apples.
113	*	*	*	---	*	A hardy and somewhat popular apple farther west. Not common in Michigan.
114	*	---	*	---	---	Vigorous, productive. A promising fruit for market and general purposes.
115	*	*	*	*	---	Moderately vigorous, very productive. Not widely disseminated.
116	*	*	*	*	---	Vigorous, upright, productive. Is a good market variety.
117	---	---	*	---	---	Vigorous, stocky; leaves large. Buds prominent. May be an old variety. Also known in Fulton Co., Ohio.
118	*	**	*	*	---	Productive. An excellent dessert apple. Deserves more attention.
119	*	*	*	---	*	Tree spreading, vigorous, prolific. Fruit very perfect, even sized, and beautiful.
120	*	*	*	*	*	Requires warm soils. Sometimes scabs or cracks. One of the best apples when perfect.
121	*	*	*	*	---	A southern variety. Hardy, vigorous. Not profitable in this latitude.
122	*	**	**	**	**	Strong, upright, hardy. Tardy bearer. Fruit sometimes uneven and imperfect. Requires good culture and careful handling.
123	---	*	---	*	---	Popular in Oakland county. Less disseminated elsewhere.
124	*	---	---	---	---	A vigorous, hardy, southern apple. Does well in eastern Michigan.
125	*	**	*	*	**	Very vigorous, productive. One of the most valuable late autumn apples.
126	**	**	*	**	**	Hardy, vigorous, very productive. Of little value except for cooking and market. Sells well; but soon decays.

SECTION I.—APPLES—CONTINUED.

Number.	Names.	Descriptions.						Use and value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Season.	Origin.	Dessert.	Cooking.	Market.
127	Orange Pippin	m	r ob	o r	g	Sept. Oct.	N. J.	7	6	8
128	Ortley, <i>White Detroit</i>	m	r ob c	g y r	v g	Nov. Feb.	N. J.	7	4	2
129	Paw Paw, <i>Rubicon</i>	m	r o	y r	v g	Dec. June.	Mich.	9	5	5
130	Peach Pond Sweet	m	ob	y r	v g	Sept. Nov.	N. Y.	6	6	6
131	Peck Pleasant	m l	r f	g y r	v g	Nov. Mar.	R. I?	9	8	9
132	Pennock	l	r f l	r y	g	Nov. Mar.	Penn.	1	1	5
133	Perry Russet	m	r c l	y ru b	g	Nov. Dec.	N. Y.	6	6	5
134	Pittsburgh	l	ob	y r	v g	Nov. Apr.	Penn.	8	8	9
135	Pomme Gris	s	ob r	ru r	b	Dec. Mar.	Eur.?	10	6	5
136	Porter	m l	o c	y r	v g	Sept.	Mass.	8	7	8
137	Pound Royal [Winter]	l	r o c	y w r	g	Dec. Apr.	Fr.?	6	5	4
138	Primate	m	r ob c	g w c r	v g	Aug. Oct.	N. Y.?	10	5	6
139	Pumpkin Sweet, <i>Pound Sweet</i>	v l	r	w g y	g	Sept. Dec.	Conn.?	2	8	4
140	Quarrenden (Devonshire)	m s	r f c	d e r	g	Aug. Sept.	Eng.	6	6	2
141	Rambo	m	r ob	y w r	v g	Oct. Feb.	N. J.?	8	5	5
142	Ramsdell Sweet, <i>English Sweet</i>	m l	o c	d r	v g	Oct. Feb.	N. E.?	6	9	4
143	Rawle Janet	m l	ob c	y r c r	g	Feb. June.	Vir.	3	1	5
144	Rebecca	m	ob	w y c r	g	Sept.	Del.	7	5	2
145	Red Astrachan	m l	r c	g y c r	g	Aug.	Rus.	5	9	10
146	Red Canada, <i>Old Nonsuch</i>	m	r ob c	y r c r	v g	Dec. June.	N. E.?	8	5	10
147	Red June	s	ov c	d r	v g	Aug.	N. C.?	7	6	2
148	Red Russet	m l	r c	y r ru	v g	Jan. Apr.	N. H.	8	7	5
149	Ribston	m	r c	y r ru	v g	Nov. Apr.	Eng.	7	7	4
150	Rhode Island Greening	l	r ob	g y r	v g	Nov. Apr.	R. I.?	9	10	9
151	Richardson	l	r c	r	g	Aug. Sept.	Mass.	6	6	5
152	Roman Stem	m	r	y b ru	v g	Nov. Mar.	N. J.	7	7	4
153	Rome Beauty	l	r c	y r	g	Nov. Feb.	Ohio.	6	7	5
154	Rose Red, <i>Autumn Rose</i>	m	r ob c	y r	v g	Nov. Jan.	N. Y.?	6	7	4
155	Roxbury Russet	m l	r ob a	y ru r	v g	Jan. June.	Mass.	6	9	7
156	Scarlet Pearmain	m	c	e r y	v g	Aug. Oct.	Eng.	9	8	5
157	Shiawassee	m	ob	w r	v g	Oct. Jan.	Mich.	10	6	8
158	Sine Qua Non	m	r c	g y	v g	Aug.	N. Y.	8	5	4
159	Slingerland	m l	r l	y r	g	Dec. Mar.	N. Y.	6	7	6
160	Smith Cider	m l	r ob c	y r	g	Dec. Mar.	Penn.	5	4	7
161	Smokehouse	m l	r ob	y c r	g	Sept. Feb.	Penn.	5	7	8
162	Sops of Wine	m	r	y r	g	Aug. Sept.	Eur.	4	6	6

SECTION I.—APPLES—CONTINUED.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern Lake Shore.	Northern Lake Shore.	
127	---	---	---	*	---	An annual bearer. Good for either dessert or market.
128	*	*	*	*	*	Moderately vigorous, upright, productive. Fruit frequently scabby and worthless.
129	*	*	*	*	---	Hardy, moderate grower, regular bearer. Must have suitable soil and good culture.
130	*	*	*	*	*	Tree vigorous, spreading, productive. A beautiful and desirable sweet apple.
131	*	*	*	*	*	Habit of tree like R. I. Greening, but less vigorous. Generally and deservedly popular. Fruit beautiful and excellent.
132	*	*	*	*	*	Sometimes profitable to ship south. Poor flavor. Very subject to bitter rot.
133	*	*	*	*	*	Distinct from Golden Russet. An early, abundant bearer. More than one variety is probably grown under this name.
134	*	---	---	*	---	Spreading. Very productive. A very promising variety. But little known.
135	*	*	*	*	*	Moderate, upright grower. Good early bearer. An excellent fine dessert apple. Less successful on light soils.
136	*	**	*	*	*	Usually very fair. Valuable for market as well as dessert.
137	*	---	---	---	---	Spreading grower. Must have high culture. Little known.
138	*	**	*	*	*	One of the best desert apples. Subject to water core and other defects. Ripens in succession.
139	*	*	*	*	*	Tree strong, upright, spreading. Fruit often water cored. Culinary.
140	*	---	---	---	---	Tree spreading, productive. Flavor fine, but fruit often imperfect or scabby; beautiful.
141	*	*	*	*	---	A vigorous but tender tree. Overbears and produces small fruit. A very common farmer's apple.
142	*	*	*	*	*	Very vigorous and productive. Best sweet apple of its season for cooking and market.
143	*	*	*	*	*	Hardy, vigorous, spreading. Better farther south. Blossoms late.
144	*	---	---	---	---	Upright, spreading, productive. A nice dessert apple. Little known here.
145	**	**	**	**	**	Strong grower; early bearer; hardy. Fruit beautiful; showy; profitable; too sour for dessert.
146	**	**	**	*	**	Very popular for market where fully proved. Tree not vigorous. Should be top-grafted in all cases. Best on strong soils.
147	*	*	*	*	*	Often small, scabby and imperfect. Quality excellent. Ripens in succession. Better farther south.
148	*	---	---	---	---	Tree much like Baldwin. The same true of fruit except the russet, and higher flavor.
149	*	*	*	*	*	Tree a good grower, productive. High, sharp flavor. Succeeds at the north.
150	*	**	*	**	**	Tree spreading, vigorous; generally productive on strong soils; best at lake shore. One of the old favorites.
151	*	---	---	---	---	Comes in with the summer and autumn fruits. Little known.
152	*	*	*	---	*	Moderately vigorous, spreading. Very productive. Not very much known in this State.
153	*	*	*	*	*	Moderate grower, productive. Inclined to overbear on old trees.
154	*	---	*	---	---	Tree spreading, productive. Desirable when fair. Often scabby and worthless.
155	*	*	*	*	*	Very liable to attacks of the codling moth. Tree strong, spreading, productive, tender. Not profitable on light soils.
156	*	---	---	---	---	Moderate grower. One of the finest and most beautiful dessert apples of its season.
157	*	*	*	*	---	Tree hardy, vigorous, upright, spreading, productive. Like Fameuse, but superior to it.
158	*	*	*	---	---	Slow grower. Prolific. A desirable dessert apple. Always perfect and even sized.
159	*	---	---	---	---	Tree vigorous, spreading, productive. Little known. Not especially desirable.
160	---	*	*	*	---	Very productive, vigorous, straggling. Valued for market purposes.
161	*	*	---	*	---	Vigorous, spreading, productive. Culinary, market.
162	*	*	*	*	*	Tree vigorous, upright, productive. Widely disseminated, but not valuable.

SECTION I.—APPLES—CONTINUED.

Number.	Names.	Descriptions.						Use and Value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Season.	Origin.	Dessert.	Cooking.	Market.
163	Stark.....	l	r c	g y r	g	Jan. May.	Ohio.?	6	6	8
164	Stillman.....	s	r c	y r	g	July. Aug.	N. Y.	7	4	2
165	St. Lawrence.....	l	ob c	y c	v g	Sept. Oct.	Can.?	8	8	9
166	Striped Bellflower.....	l	o c	w r	g	Oct. Jan.	Ohio.?	2	5	5
167	Summer Hagloe.....	l	r ob	w y r	v g	Aug. Sept.	N. J.?	5	7	7
168	Summer Pearmain.....	m	o	y r	b	Sept.	Am.	10	5	5
169	<i>American Summer.</i> Summer Pippin.....	m l	r o c	y cr	v g	Aug. Sept.	N. Y.?	8	8	8
170	<i>Champlain, Nyack.</i> Summer Pound Royal.....	l	r ob c	g w	g	Aug. Sept.	Am.	6	8	7
171	Summer Queen.....	l	r c	y r	g	Aug. Sept.	N. Y.?	6	7	6
172	Summer Rambo, <i>Rambour</i>	l	ob	g y r	g	Sept.	Fr.	6	8	6
173	Summer Rambo (Mich.).....	m	r f	w y r	v g	Sept.	Ind.	9	7	4
174	Summer Rose.....	s	r	y r	b	Aug.	N. J.	10	7	5
175	Summer Paradise.....	l	r f	g y	v g	Aug. Sept.	Penn.	9	7	4
176	Swaar.....	l	r ob	y ob	b	Dec. Apr.	N. Y.	10	6	4
177	Sweet Bough.....	l	o ov	g y r	v g	Aug.	Am.	8	7	6
178	<i>Large Yellow Bough.</i> Sweet Winesap.....	m	ob c	r cr	v g	Nov. Mar.	Penn.	6	9	7
179	<i>Henrick Sweet.</i> Sweet Rambo.....	m	r ob	y r	g	Oct. Dec.	Penn.?	2	5	---
180	Sweet Vandevere.....	m	r ob	y r	g	Nov. Mar.	Am.	---	6	---
181	Talman Sweet.....	m	r	w y r	v g	Nov. Apr.	R. I.	6	8	6
182	Tetofsky.....	m	r ob c	y r	g	Aug.	Rus.	5	7	---
183	Tewksbury.....	s	ob	y r	v g	Jan. July.	N. J.	7	7	5
184	Tompkins King.....	l	r f c a	y r cr	v g	Dec. Mar.	N. J.?	7	6	7
185	Toole Indian.....	l	r c	g y r	g	Sept. Oct.	Am.	6	8	5
186	Townsend.....	m	ob c	y r	g	Aug. Sept.	Penn.	6	6	7
187	Trenton Early.....	m l	r ov	y r	g	Aug.	Am.?	6	6	8
188	Twenty Ounce.....	v l	r	g y r	g	Oct. Jan.	Conn.	5	7	9
189	<i>Cayuga Redstreak.</i> Vandevere.....	m	ob	y r	g	Nov. Mar.	Del.	6	8	9
190	Wagener.....	m	r ob	y cr	v g	Nov. Mar.	N. Y.	9	6	6
191	Walpole.....	m	r	y r	v g	Aug. Sept.	Mass.	7	5	2
192	Washington Royal.....	m l	r ob	y g r	v g	Dec. June.	Mass	7	6	3
193	Washington Strawberry.....	l	r c f	y r	v g	Sept. Oct.	N. Y.	7	7	8
194	Water.....	m	r c	w y cr	v g	Oct. Dec.	Penn.	8	6	7
195	Wealthy.....	m	r ob	y cr	v g	Autumn.	Minn.	8	6	8
196	Westfield.....	m l	r c	g r ru	b	Oct. Mar.	Conn.?	9	3	7
197	Wetherell Sweet.....	m	r c	y r	v g	Sept. Oct.	N. J.	7	9	4

SECTION I.—APPLES—CONTINUED.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern Lake Shore.	Northern Lake Shore.	
163	*	*	*	*	*	Tree vigorous, hardy, productive. Fruit good enough to sell. Valued as a market fruit.
164	*	---	---	*	---	Tree upright, productive. Little known. Not desirable compared with others in season.
165	**	**	*	**	**	Tree very vigorous, productive. Highly and justly valued. Sometimes cracks and scabs.
166	*	*	*	*	*	Known at Adrian as Fall or Striped Gilliflower. Large and showy, but not profitable or valuable.
167	*	---	---	---	---	Vigorous, productive. An old and useful culinary variety.
168	*	*	*	*	*	Slow grower, hardy. Fruit, when perfect, mild, rich, excellent. Very beautiful.
169	*	*	*	*	---	Tree vigorous; forms a round head, productive. A valuable variety.
170	*	*	*	*	---	Very vigorous. Productive. A profitable market apple for its season.
171	*	*	*	*	*	Liable to scab. One of the best cooking apples. Popular.
172	*	*	*	*	---	A large, vigorous tree, moderately productive. Rarely planted. Profitableness doubtful.
173	*	*	*	---	---	Tree similar to Rambo. Also the fruit a similar tendency to overbear. Superior flavor.
174	*	*	*	---	*	Tree moderately vigorous, productive. One of the finest dessert fruits of its season.
175	*	*	*	*	---	Treespraying, drooping, moderate regular bearer. Very desirable among sweet apples.
176	*	*	*	*	*	Can only be recommended as an amateur fruit. Tree lacks hardiness. Fruit often imperfect. Requires rich, warm, dry soil.
177	*	**	*	*	*	Tree a little tender and lacks productiveness. The most popular early sweet apple.
178	*	---	---	*	---	Recommended as successful and profitable at Lawton and in Wayne county.
179	*	---	---	---	---	Tree vigorous, upright, a tardy bearer. Little known. Of doubtful value here.
180	*	---	*	---	---	Tree a crooked grower, productive. Not disseminated. Too many competitors.
181	*	*	**	*	**	Best winter baking apple. The most popular and profitable sweet market apple.
182	*	*	*	*	*	Of little value, except where great hardiness is required.
183	*	*	*	---	*	Tree vigorous, upright, productive. A fine, long-keeping table fruit.
184	*	*	*	*	*	Apt to blow down. A good early winter dessert fruit. Improves at the north.
185	*	*	*	*	---	Tree vigorous, upright, moderately productive. A showy, attractive, and profitable market fruit.
186	*	---	---	---	---	Tree vigorous, upright, spreading, productive. Little known; almost "very good."
187	*	*	*	*	---	Tree moderately vigorous, productive, hardy. A fine, profitable, orchard fruit.
188	*	*	*	*	*	Fruit sometimes imperfect in Lenawee county. Very profitable for market
189	*	*	*	*	*	Distinct from N. Y. Vandevere. This variety is widely planted. Valuable.
190	*	**	*	**	**	Very early bearer; ruining the tree unless thinned and highly cultivated. Fine dessert apple. Sells well in market.
191	*	---	---	---	---	Tree of moderate vigor. Comes in the season of the summer fruits. Hence less valued.
192	*	---	---	---	---	Tree vigorous, prolific. Fruit quite variable in size.
193	*	*	*	**	---	Tree vigorous. Bears early and abundantly. A valuable variety for general purposes.
194	*	*	---	*	---	Tree vigorous, upright. Blooms late. A fine, mild dessert apple. Not widely known.
195	*	---	---	---	*	Originated with Peter M. Gideon. Valuable at the north. Very hardy.
196	*	*	*	*	*	Popular old variety for home use. Somewhat lacking in productiveness, and hence unprofitable.
197	*	---	---	---	---	Introduced into Wayne county as Honey Sweet.

SECTION I.—APPLES.—CONTINUED.

Number.	Names.	Description.						Use and value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Season.	Origin.	Dessert.	Cooking.	Market.
198	White Doctor	l	r ob	g y	g	Sept. Oct.	Penn.	6	9	7
199	White Pippin	l	r ob l	g w y	v g	Jan. Apr.	Am.?	6	7	5
200	White Spanish Reinette.....	v l	r ob	y g o r	v g	Oct. Jan.	Spain.	9	10	6
201	Williams	m	r oc	r	g	Aug. Sept.	Mass.	6	5	7
202	Willow Twig, <i>James River</i>	m	r c	y r	g	Dec. May.	Vir.	5	7	7
203	Wine, <i>Hays Winter</i>	m l	r f	d r y	g	Oct. Mar.	Del.	7	7	6
204	Winesap.....	m	r ob c	d r y	v g	Nov. May.	N. J.	6	6	4
205	Winter Pippin [Mich.]	m l	r ob	g y	g	Dec. May.	N. Y.	7	7	8
206	Winter Paradise.....	m l	r ob	g b	v g	Nov. Mar.	Penn.	6	6	2
207	Winthrop Greening	l	ob	g y ru	g	Sept.	Me.	7	7	6
208	Yellow Bellflower	v l	o c	g y r	v g	Dec. Mar.	N. J.	8	10	7
209	Yellow Newtown.....	m	r ob l	y r	b	Dec. May.	N. Y.	10	8	3

SECTION II.—APPLES—CRABS.

ABBREVIATION FOR THIS SECTION.

Form.

a. angular.
c. conical.
f. flattened.
l. lopsided or oblique.

o. oblong.
ob. oblate or obtuse.
ov. oval or ovate.
r. roundish.

Number.	Names.	Description.						Use and value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Season.	Origin.	Dessert.	Cooking.	Market.
1	Byers.....	m	r c f	dr	g	Sept.	Mich.	5	7	7
2	Hyslop	l	r ov	d r o	g	Sept. Nov.	Am.	4	8	10
3	Large Red	l	r ov	y r	g	Sept. Oct.	Am.	4	6	6
4	Large Yellow.....	l	r ov	y o	g	Sept. Oct.	Am.	5	8	8
5	Montreal	l	r ob	y r	g	Sept. Oct.	Am.	4	7	8
6	Red Siberian.....	s	r ob	y s	g	Sept. Oct.	Eur.	3	6	4
7	Soulard	m	ob	g y	g	Nov. Dec.	Mo.	1	4	1
8	Transcendent	l	r ob	y cr	g	Sept.	Am.	5	8	10
9	Whitney.....	l	r ov	y r	b	Sept.	Ill.	7	8	9

SECTION I.—APPLES.—CONTINUED.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern lake shore.	Northern lake shore.	
198	*	*	---	---	---	Tree strong and prolific. A showy and profitable culinary and market fruit. Little known.
199	*	*	*	*	*	Tree vigorous, upright, productive. Fruit of the Newtown Pippin class. Popular south.
200	*	---	---	---	---	Tree and fruit much like Fall Pippin, but keeps longer. Seldom seen under its own name.
201	*	*	*	*	---	Tree a good grower; productive. Valued by some as a market variety.
202	*	*	*	*	*	Hardy, vigorous, productive. Fruits vary greatly in size. Keep and sell well.
203	---	*	---	---	---	Hardy, prolific. A fine, though little known, winter fruit.
204	*	*	*	*	*	Irregular grower; good, early bearer. Good for dessert, market or cider—Downing. Valuable in Lenawee county.
205	*	---	---	---	*	Strong, upright grower; slender shoots. Profitable. Probably an unrecognized eastern sort.
206	*	---	*	---	---	Tree hardy, upright, vigorous; a tardy bearer. Productive. Little grown.
207	*	---	---	---	---	Tree vigorous, upright, spreading. A large, showy fruit. Little grown.
208	*	*	*	*	*	Needs dry, warm soils. High, rich flavor. Uneven in size. Often unproductive. Not successful at the north. Fruit much in demand.
209	*	*	*	*	---	Tree and fruit like the Green Newtown. Some doubt their distinctness.

SECTION II.—APPLES—CRABS.

ABBREVIATIONS FOR THIS SECTION.

Color.

b. brown.
c. carmine.
cr. crimson.
d. dark.

g. green.
o. orange.
p. purplish.
r. red.

ru. russet.
s. scarlet.
v. vermillion.
y. yellow.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern lake shore.	Northern lake shore.	
1	---	**	---	*	**	Tree slender, weak grower. A very beautiful crab. Origin, Van Buren county.
2	*	*	*	**	*	An exceedingly rich looking crab. Keeps well. Sells well.
3	*	*	*	*	*	A vigorous tree, productive. Has the calyx large and prominent.
4	*	*	*	*	*	One of the most beautiful and prolific. Bears in alternate years.
5	*	*	*	*	**	Unexcelled in beauty of appearance. Said to be less beautiful at the north.
6	*	*	*	*	*	Sometimes called "small red." Quite small, beautiful. Often scabby on old trees.
7	---	---	---	*	*	Of little value except for cider and cooking. Worthless.
8	**	**	**	**	**	One of the largest, most productive, and beautiful of the older crabs.
9	---	---	---	**	---	Very large, beautiful, and excellent. Tree vigorous, upright, productive.

SECTION III.—APRICOTS.

ABBREVIATION FOR THIS SECTION.

Form.

Color.

c. conical.
co. compressed.
d. depressed.

o. oblong.
ov. oval.
r. roundish.

o. orange.
r. red.
y. yellow.

Number.	Names.	Description.						Use and value, Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Season.	Origin.	Dessert.	Cooking.	Market.
1	Breda	m	r	o	v g	b. Aug.	Eur.	7	---	---
2	Early Golden	s	r ov	o	v g	m. July.	Am.	6	---	---
3	Hemskirk	l	r co	o r	b	e. July.	Eur.	8	---	---
4	Large Early	m	o co	o	b	m. July.	Eur.	8	---	---
5	Moorpark	l	r	o y	b	b. Aug.	Eur.	9	---	---
6	Peach	v l	r d co	y o	b	b. Aug.	Eur.	10	---	---
7	Red Masculine	s	r	y o r	v g	m. July.	Eur.	6	---	---
8	St. Ambroise	l	r co	y r	b	m. Aug.	Eur.	9	---	---
9	Turkey	m	r	y o	v g	m. Aug.	Eur.	8	---	---

SECTION III.—APRICOTS.

Apricots are recommended for dessert or amateur purposes, with little reference to actual profit, as owing to occasional loss of the very early bloom, and liability to injury from extreme cold in unfavorable localities, together with extreme liability to the depredations of the curculio, little pecuniary return can be confidently anticipated from them. Since they are recommended only as amateur fruits, they are not quoted for cooking or market.

Number.	Locality.						Remarks.
	East.	Center.	South.	Southern lake shore.	Northern lake shore.		
1	*	*	*	*	*		Hardy, productive, excellent. Kernel sweet.
2	†	†	†	†	†		Tree vigorous. Branches long, slender. Freestone.
3	†	†	†	†	†		Beautiful, excellent. Stone not perforated. Kernel bitter.
4	†	†	†	†	†		Vigorous. One of the best early varieties. Freestone. Kernel bitter.
5	*	*	*	*	†		One of the most popular. Stone perforated. Kernel bitter.
6	*	*	*	*	*		Considered the finest variety. Stone perforated. Kernel bitter.
7	†	†	†	†	†		Hardy, productive. Not high flavor. Kernel bitter.
8	†	†	†	†	†		Earlier than Moorpark. Juicy, sweet, rich.
9	†	†	†	†	†		Old. Later than Moorpark. Stone impervious. Kernel sweet.

SECTION IV.—BLACKBERRIES.

ABBREVIATIONS FOR THIS SECTION.

Form.

c. conical.
o. oblong.ov. oval.
r. roundish.

Number.	Name.	Descriptions.						Use and value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Season.	Origin.	Dessert.	Cooking.	Market.
1	Agawam.....	l	r o	b	v g	m	Am.	9	---	8
2	Ancient Briton.....	l	o ov	b	v g	l	Ark.	8	7	9
3	Barnard.....	l	o ov	b	v g	l	Wis. ?	8	7	9
4	Dorchester.....	m	o c	b	b	m	Mass.	7	5	7
5	Early Harvest.....	s	r o	b	v g	v e	Ill.	8	---	3
6	Erie.....	l	r o	b	v g	m	Pa.	8	---	9
7	Kittatinny.....	l	r c	b	b	m	N. J.	10	10	9
8	Minnewaski.....	l	o ov	b	v g	m	N. Y.	9	9	9
9	New Rochelle, <i>Lawton</i>	l	ov	b	g	l	N. Y.	9	9	8
10	Snyder.....	m	r ov	b	v g	e	Ind.	9	8	10
11	Stone.....	m s	r	b	v g	e	Wis.	9	9	7
12	Taylor.....	l	r o	b	v g	e	Am.	10	10	9
13	Wachusett.....	m	o ov	b	v g	e	Mass.	7	---	8
14	Wallace.....	l	o ov	b	v g	m	Am.	9	---	9
15	Western Triumph.....	m	ov	b	v g	m l	Am.	8	8	9
16	Wilson.....	l	o ov	b	g	e	N. J.	7	8	9
17	Wilson Junior.....	l	o ov	b	g	e	N. J.	8	8	9

DEWBERRIES.

These are so closely allied with the Blackberries that they are placed in connection with them rather than in alphabetical order. The columns and abbreviations correspond with those for the Blackberry.

Number.	Names.	Descriptions.						Use and Value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Season.	Origin.	Dessert.	Cooking.	Market.
1	Bartle.....	s m	r o	b	g	v e	Am.	5	---	2
2	Lucretia.....	l	o ob	b	v g	v e	Va.	8	---	7
3	Mammoth.....	s m	r o	b	g	v e	Am.	4	---	2

SECTION IV.—BLACKBERRIES.

ABBREVIATIONS FOR THIS SECTION.

Color.

b. black.
w. white.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern Lake shore.	Northern Lake shore.	
1	---	---	---	*	---	Not fully hardy, but productive and fine.
2	---	---	---	*	---	Strong grower and prolific. Well worthy of extended trial.
3	---	---	---	*	---	Comes from west of Lake Michigan, with a reputation for hardiness.
4	*	*	*	*	---	An old New England variety. Of superior flavor. Now nearly out of cultivation.
5	---	---	---	*	---	Brunton has been disseminated under this name. The genuine is claimed to be hardy.
6	---	*	*	*	---	A strong, spreading grower. Productive.
7	**	**	**	**	*	Too well known to need description. Sometimes rusts or mildews.
8	*	*	*	*	*	Vigorous, hardy, productive.
9	*	*	*	**	*	Plant grows late. Tender. Fruit colors before fully mature. Quality best when fully ripe.
10	*	*	*	*	**	Not large, but good. Very hardy and prolific.
11	---	---	---	*	---	Bears heavily. Size rather small. Hardy. In Lenawee county equals Snyder for market.
12	---	*	---	*	---	Claimed to be as hardy as Snyder.
13	---	---	---	*	---	Hardy. Nearly thornless.
14	---	---	---	*	---	Nearly hardy; vigorous; productive.
15	---	---	---	*	---	Hardy, vigorous and prolific. Valuable in Lenawee county.
16	*	*	*	*	**	One of the largest. Lacks richness. Needs winter protection.
17	---	---	---	*	---	Much like Wilson in both plant and fruit.

DEWBERRIES.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern Lake shore.	Northern Lake shore.	
1	---	---	---	---	---	An uncertain bearer. Fruit often small.
2	---	---	*	---	---	The largest, most productive and best.
3	---	---	---	---	---	Occasionally bears profusely. Often small.

SECTION V.—CHERRIES.—HEART AND BIGARREAU.

ABBREVIATIONS FOR THIS SECTION.

Form.

a. angular.
co. compressed.c. conical.
o. ovate or oval.l. long.
h. heart shaped.ob. obtuse.
r. roundish.

The numbers under the head of "cooking" recommend strictly for canning or drying with sugar as raisins.

Number.	Names.	Descriptions.							Use and value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Season.	Class.	Origin.	Dessert.	Cooking.	Market.
1	American Heart	l	h	a b r	g	m June	h	Am.	6	----	7
2	Bauman May	s	ov h a	d r	g	b June	b	Ger.	5	----	3
3	Belle D'Orleans	l	r h	w y r	v g	b June	h	Fr.?	8	----	8
4	Bigarreau, <i>Yellow Spanish</i>	v l	ob h co	y c r	b	e June	b	Eur.	10	9	7
5	Black Eagle	m	ob h	b	b	b July	h	Eng.	9	8	9
6	Black Hawk	l	ob h co	p b	v g	e June	h b	Ohio.	9	6	9
7	Black Heart	l	h	b	v g	e June	h	Eur.	9	6	9
8	Black Tartarian	v l	ob h	p b	v g	m June	h b	Rus.	9	8	9
9	Brant	l	r co ha	r b	v g	m June	h b	Ohio.	8	----	7
10	Burr	l	h	w y r	v g	e June	h	N. Y.	9	6	8
11	Champagne	m	r h	r	v g	e June	h	N. Y.	8	----	6
12	Cleveland	l	r h	r y	v g	m June	b	Ohio.	9	6	8
13	Coe Transparent	m	r	a r	b	m June	h	Conn.	10	6	5
14	Delicate	m l	r ob	a y r	b	e June	h	Ohio.	10	----	5
15	Doctor	m	r h	y r	v g	b June	h	Ohio.	8	----	7
16	Downer (Late)	m	r h ov	a r	v g	b July	h	Mass.	9	6	10
17	Downton	l	ob h	br y r	v g	e June	h	Eng.	9	----	6
18	Early Purple	m	r h	d r p	v g	b June	h	Eur.	9	6	6
19	Elton	l	l h	y br r	v g	m June	b	Eng.	9	7	9
20	Governor Wood	l	r h	y r	v g	m June	h	Ohio.	9	6	8
21	Kirtland Mary	l	r h	y r	v g	b July	b	Ohio.	8	----	7
22	Knight Early	l	ob h	d p b	v g	m June	h	Eng.	8	6	6
23	Logan	m	ob h	p b	v g	e June	b	Ohio.	7	----	6
24	Manning Mottled	l	r b co	a r	v g	e June	h	Mass.	8	----	5
25	Mezel, <i>Bigarreau De Mezel</i> , <i>Great Bigarreau</i> ,	v l	ob h	d r b	g	b July	b	Eur.	6	6	8
26	Napoleon	v l	l h	y r	g	b July	b	Eur.	6	6	8
27	Ohio	l	ob h	r	v g	m June	h	Ohio.	7	----	8
28	Osceola	m l	r h	d r	v g	e June	h	Ohio.	8	----	7
29	Pontiac	l	ob h	d p r	v g	e June	h b	Ohio.	8	----	8
30	Powhattan	m	r co	d r	g	m July	h b	Ohio.	5	----	9
31	Red Jackét	l	ob h	a r	g	b July	h b	Ohio.	7	7	9
32	Rockport	l	r ob h	r a	b	m June	b	Ohio.	9	7	9
33	Sparhawk	m	r h	a r	v g	e June	h	Mass.	8	8	8
34	Tecumseh	m l	ob h	r p	g	e July	h b	Ohio.	6	----	8

SECTION V.—CHERRIES.—HEART AND BIGARREAU.

ABBREVIATIONS FOR THIS SECTION.

Color.		Class.	
a. amber.	cr. crimson.	w. whiteish.	b. bigarreau.
b. black.	d. dark.	y. yellowish.	h. heart.
br. bright.	p. purplish.		
c. carmine.	r. red.		

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern lake shore.	Northern lake shore.	
1	*	*	*	*	---	Vigorous, spreading, productive; but variable in quality.
2	*	*	*	*	*	One of the earliest and most prolific. Too small and poor in flavor.
3	*	*	*	*	*	Largest and best of the very early varieties. Tree vigorous, spreading, productive.
4	*	*	*	*	*	Downing says: "Largest, most beautiful, and delicious of cherries." Often cracks and rots in wet seasons.
5	*	*	*	*	*	Excellent. Requires age before it will bear profusely.
6	*	*	*	*	---	Fine Tree. Fruit much like Bigarreau in its general qualities.
7	*	*	*	*	*	Very old. Tree large and hardy. The abundant fruit is of fine quality.
8	**	**	**	**	**	A rapid, erect grower. Prolific. Fruit very large and showy, but not of the highest quality. Tree lacks hardiness.
9	*	*	*	*	---	One of the many fine Ohio varieties of comparatively recent origin.
10	*	*	*	*	---	A vigorous tree. Bears early and profusely.
11	*	---	---	---	---	Originated with Mr. Downing at Newburgh, N. Y.
12	*	*	*	*	---	A seedling of the late Dr. Kirtland, of Cleveland, Ohio. Tree thrifty, spreading, productive.
13	*	*	*	*	**	One of the finest and most beautiful of the tender fleshed cherries.
14	*	---	---	*	---	Delicate as its name imports. Excellent for home use.
15	*	*	*	*	---	Tree a free spreading grower. Good cultivation requisite to produce fine fruit. At Lawton, not worthy of cultivation.
16	**	**	*	**	---	One of the finest and most valuable late cherries. Of New England origin.
17	*	*	*	*	---	An English seedling. Supposed to have sprung from the Elton.
18	*	*	*	**	*	A moderate grower. One of the best of the very early cherries. Hardy for a Muzzard; but tender at the north.—[Parnellee.]
19	*	**	*	*	**	Originated in England in 1806. One of the best of its class and season.
20	**	**	*	**	*	Seedling of the late Dr. Kirtland. Every way desirable except for its liability to rot.
21	*	*	*	*	---	Seedling of the late Dr. Kirtland. Desirable for either dessert or market.
22	*	**	*	*	*	A week earlier than Black Tartarian. Fine quality. Tree spreading.
23	*	*	*	*	---	Seedling of the late Dr. Kirtland. Ranks high in quality. But little known.
24	*	*	*	*	---	Tree vigorous, prolific. Named from the mottled appearance of the fruit.
25	---	*	*	---	---	Supposed to be identical with Great Bigarreau and Large Red Prool.
26	*	*	*	*	**	Very large and showy. Very firm. Most valued for the market.
27	*	*	*	*	*	Seedling of the late Dr. Kirtland. Productive and valuable.
28	*	*	*	*	---	Seedling of the late Dr. Kirtland. Moderate grower and bearer. Flavor excellent.
29	*	*	*	*	---	Seedling of the late Dr. Kirtland. Vigorous, productive. Valuable either as a table or market fruit.
30	*	---	---	*	---	Seedling of the late Dr. Kirtland. One of the best for market purposes.
31	*	*	---	*	---	Seedling of the late Dr. Kirtland. Vigorous, spreading, productive. Very desirable for market.
32	*	*	*	*	---	Seedling of the late Dr. Kirtland. Very highly esteemed. A good bearer.
33	*	*	*	*	---	Origin Massachusetts. Vigorous; productive when trees have acquired sufficient age.
34	*	*	*	*	---	Seedling of the late Dr. Kirtland. Moderate grower; productive. Desirable for its lateness.

SECTION VI.—CHERRIES—DUKE AND MORELLO.

ABBREVIATIONS FOR THIS SECTION.

Form.
co. compressed.
h. heartshaped.
ob. oblate.
ov. oval.
r. roundish.

Color.
a. amber.
b. bright.
d. dark.
p. purplish.
r. red.
y. yellow.

Number.	Names.	Descriptions.							Use and value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Season.	Class.	Origin.	Dessert.	Cooking.	Market.
1	Archduke.....	l	ob h	d r	v g	m July.	d	Eur.	7	6	7
2	Carnation	l	r	y w r	g	m July	----	Fr.?	6	6	5
3	Choisy	m	r ob	y a r	b	m June	d	Fr.	10	6	3
4	Donna Maria.....	m	r	d r	g	m July.	m	Eur.?	4	6	6
5	Early Richmond, <i>Kentish</i>	m	r ob	d r	v g	m June.	m	Eur.	5	9	10
6	Eugenie	l	r ob	d r	v g	m June.	d	Eur.	7	6	7
7	Jeffry	m	r ob	b r	v g	m June.	d	Eur.	6	6	6
8	Late Duke.....	l	ob h	d r	v g	m July.	d	Eur.	7	7	6
9	Late Kentish, <i>Common Red</i>	m	r ob	d r.	g	m July.	m	Eur.	4	8	8
10	Leib	m	r	r	g	July.	m	Eur.?	----	----	----
11	Louis Phillippe.....	l	r	d p r	v g	e July.	m	Fr.	4	10	10
12	Magnifique	l	ob	r	v g	e July.	d	Fr.	6	8	7
13	May Duke	l	r ob h	d r	b	m June.	d	Eur.	8	8	10
14	Montmorency	l	r ob	d r	v g	e June.	m	Eur.	5	8	10
15	Morello	l	ob h	d r	v g	m July.	m	Eur.	5	10	10
16	Plumstone	l	r h	d r	g	b Aug.	m	Eur.	4	10	3
17	Reine Hortense.....	v l	r ov	b r	v g	m July.	d	Fr.	6	7	6
18	Royal Duke	l	r ob	d r	g	e June.	d	Eur.	6	7	7

SECTION VI.—CHERRIES—DUKE AND MORELLO.

ABBREVIATIONS FOR THIS SECTION.

Class.

d. duke.

m. morello.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern Lake Shore.	Northern Lake Shore.	
1	*	*	*	*	---	Tree vigorous, upright, hardy, prolific.
2	*	**	*	*	---	A beautiful, large, light-red cherry, highly esteemed where known.
3	*	**	*	*	*	One of the best dessert cherries of any class, but a thin bearer. When on sandy soil, or top-grafted on Morello proves productive.
4	*	---	---	*	---	A small tree. Very prolific.
5	**	**	**	**	*	One of the most profitable market cherries. Not as good as several of the Dukes.
6	---	---	---	*	---	A new French cherry. An early and prolific bearer.
7	*	---	---	*	---	A tree of compact habit and slow growth. A prolific bearer.
8	*	*	*	*	---	Valuable for dessert or cooking. Ripening after Mayduke.
9	*	*	*	*	---	Emphatically the pie cherry of this country.
10	---	---	*	*	---	A newly introduced variety. Claimed to withstand the winters of the north-west. Unproductive.
11	---	*	*	*	---	A strong, healthy tree of the Morella class. Productive, valuable.
12	*	*	*	*	*	Moderate grower, productive. Good for dessert when fully ripe.
13	**	**	**	**	**	The type of its class. One of the oldest and most popular cherries.
14	---	*	---	*	---	Larger than Early Richmond and ten days later.
15	*	*	*	*	*	Highly esteemed for preserving and other culinary purposes.
16	*	*	*	*	*	One of the best culinary sorts, but a slow grower and a tardy bearer.
17	*	**	*	*	*	A healthy and beautiful tree. A popular and desirable variety.
18	*	*	*	*	*	An upright, compact grower. Later than Mayduke.

SECTION VII.—CURRANTS.

ABBREVIATIONS FOR THIS SECTION.

Form of bunch.

l. long.
m. medium.
s. short.

Color.

b. black.
br. bright.
d. dark.
r. red.
w. white.

Number.	Names.	Descriptions.						Use and value. Scale 1 to 10.		
		Size.	Form of bunch.	Color.	Flavor.	Season.	Origin.	Dessert.	Cooking.	Market.
1	Angers, <i>Fertile d'Angers</i>	l	l	r	a	m July	Fr.	8	9	9
2	Cherry.....	l	s	r	v a	m July	Eur.	4	8	10
3	Fay.....	l	l	r	a	July	N. Y.	5	8	9
4	Hative.....	l	m	d r	a	m July	Fr.	8	8	8
5	Lee.....	l	s	b	a m	m July	Eur.	1	8	9
6	Naples.....	l	s	b	a m	m July	Eur.	1	8	9
7	Red Dutch.....	m	m	d r	a	b m July	Eur.	9	10	9
8	Versaillaise.....	l	s	d r	a	m July	Fr.	7	8	---
9	Victoria.....	m	l	br r	v a	e July	Eng.	6	7	9
10	White Dutch.....	m	m	w	a	b m July	Eur.	10	7	6
11	White Grape.....		m	w	a	b m July	Eur.	9	8	8

SECTION VIII.—GOOSEBERRIES.

ABBREVIATIONS FOR THIS SECTION.

Form of berry.

ov. oval.
r. round.

Number.	Names.	Descriptions.						Use and value. Scale 1 to 10.		
		Size.	Form of berry.	Color.	Quality.	Season.	Origin.	Dessert.	Cooking.	Market.
1	Downing.....	m l	r ov	w g	v g	Aug.	N Y.	10	10	10
2	Houghton.....	s	r	b	v g	Aug.	Mass.	8	10	9
3	Mountain.....	l	r ov	r	g	m Aug.	N. Y.	5	7	5
4	Pale Red.....	m	r ov	r	g	Aug.	Am.	4	7	9
5	Smith.....	l	ov	g	v g	Aug.	Ver.	10	10	9

SECTION VII.—CURRANTS.

ABBREVIATIONS FOR THIS SECTION.

Flavor.

a. acid,
m. musky.
v. very.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern Lake shore.	Northern Lake shore.	
1	*	---	---	*	---	Comparatively little known.
2	*	*	*	*	*	Its size renders it popular. One of the most acid of currants.
3	*	*	*	*	*	Long bunch. Large berry. Very productive.
4	---	---	*	*	*	The best of the less common kinds.—(Steere.)
5	---	*	---	*	---	Possibly a slight improvement upon Black Naples.
6	*	*	*	*	*	Good culinary fruit. Much sought in the market by foreigners.
7	**	**	**	**	**	Has no superior except in size. The best for all purposes.
8	*	**	*	*	*	By some believed to be superior to the cherry currant. Others think them identical.
9	*	*	*	**	**	Valuable, rather late sort. It seems to be exempt from the attacks of the borer.
10	*	**	*	*	**	Better in quality, and in the habit of the plant than White Grape.
11	*	**	*	*	**	Plant of spreading, straggling growth. Larger, but not as good as White Dutch.

SECTION VIII.—GOOSEBERRIES.

ABBREVIATIONS FOR THIS SECTION.

Color.

b. brown.
g. green.
r. red.
w. whitish.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern Lake shore.	Northern Lake shore.	
1	*	**	*	*	*	Fine, stocky, vigorous plant; quite thorny. The highest quality of fruit.
2	*	*	*	*	*	Slender and straggling, but vigorous, prolific, and excellent.
3	*	*	*	*	*	A strong plant. Berry with a very thick skin; and uneven size. Poor quality.
4	*	*	*	*	*	An old sort of slender but upright growth.
5	*	*	*	*	*	Some doubt as to the vigor of the plant. An excellent variety.

SECTION IX.—GRAPES—NATIVE.

ABBREVIATIONS FOR THIS SECTION.

Bunch.		Form.		Berry.	
b. broad.	o. open or loose.	sh. shouldered.	r. round.		
c. compact.	s. short.	v. very.	o. oblong.		
l. long.			ov. ovate or oval.		

Number.	Names.	Descriptions.								Use and value. Scale 1 to 10.		
		Size.		Form.		Color.	Quality.	Season.	Origin.	Dessert.	Cooking.	Market.
		Bunch.	Berry.	Bunch.	Berry.							
1	Adirondac.....	l	l	c sh	r	p b	v g	b Sept	N. Y.	8	---	4
2	Agawam, <i>Rog. 15.</i>	l	l	c sh	r	d r	v g	m Sept	h Mass.	7	---	7
3	Aminia, <i>Rog. 39</i>		l	---	r	b	v g	m Sept	h Mass.	8	---	7
4	Barry.....	l	l	s b c	r	b	g	m Sept	h Mass.	7	---	8
5	Brighton.....	m	l	c sh	r	r	v g	m Sept	W. N. Y.	10	---	9
6	Canada, <i>Arnold's 16</i>	m l	m l	sh	r	b	g	m Sept	h Ont.	8	---	3
7	Catawba.....	m	l	sh o	r	r	v g	Oct.	Md.	9	---	6
8	Champion, <i>Tulman</i>	m	l	s c sh	r	b	g	b Sept	Am.	4	---	8
9	Clinton.....	m	s	c sh	r	b	g	Oct.	N. Y.	3	---	3
10	Concord.....	l	m l	c sh	r	b	v g	m Sept	Mass.	7	---	10
11	Cottage.....	l	l	l	r	b	g	b Sept.	Mass.	6	---	7
12	Creveling.....	m l	m	l sh	r	b	v g	m Sept	Pa.	8	---	2
13	Delaware.....	s	s	c sh	r	l r	b	m Sept	N. J.?	10	---	8
14	Diamond.....	l	l	l sh	r	w	v g	m Sept	N. Y.	9	---	9?
15	Diana.....	l	l	c l	r	r l	v g	e Sept	Mass.	6	---	6
16	Eaton.....	v l	v l	l sh	r	b	g	m Sept	Mass.	4	---	10?
17	Elvira.....	m	s	s	r	g w	g	e Sept	Mo.	4	---	6
18	Empire State.....	l	m	sh	r ov	w	v g	m Sept	N. Y.	8	---	---
19	Essex, <i>Rog. 41</i>	l	v l	---	r	b	g	m Sept	h Mass.	---	---	---
20	Eumelan.....	l	m	c sh	r	p b	v g	m Sept	N. Y.	9	---	2
21	Gaertner.....	m	m	b	r	r	v g	m Sept	Mass.	6	---	4
22	Goethe.....	m	l	o v	r	y g	v g	e Sept	Mass.	8	---	3
23	Hartford.....	l	l	c sh	r	b	g	b Sept	Conn.	4	---	6
24	Hayes.....	m	m	s b	r	y w	v g	Sept.	Mass.	8	---	---
25	Herbert, <i>Rog. 44</i>	l	l	l	r	b	v g	m Sept	h Mass.	6	---	---
26	Iona.....	l	l	o ch	r o	r	b	m Sept	N. Y.	10	---	6
27	Isabella.....	l	l	c sh	o	b	v g	e Sept	S. Car.	6	---	7
28	Israella.....	m l	l	c sh	o	p f	v g	m Sept	N. Y.	7	---	4
29	Ives.....	m	m	c sh	r o	b	g	e Sept	Ohio.	7	---	8
30	Janesville.....	s	m	s c	r	b	g	b Sept	Am.	7	---	9
31	Jessica.....	m s	m s	---	r	y g	b	b Sept	Ont.	9	---	---
32	Jewell.....	s	s	s	r	b	v g	b Sept	Kans.	9	---	5

SECTION IX.—GRAPES—NATIVE.

ABBREVIATIONS FOR THIS SECTION.

Color.

a. amber.
b. black.
d. dark.
g. greenish.

l. light.
ll. lilac.
p. purple.

r. redish.
w. whitish
y. yellowish.

Number.	Locality.						Remarks.
	East.	Center.	South.	Southern. Lake Shore.	Northern Lake Shore.		
1	*	*	*	*	*		One of the finest very early grapes. Subject to mildew of the foliage. Rarely successful.
2	*	*	*	*	*		Keeps well after gathering.
3	---	---	---	*	*		Very well esteemed by those who have fruited it.
4	*	*	*	*	*		One of Rogers's very numerous hybrids.
5	---	**	---	*	---		One-fourth foreign. Highly satisfactory.
6	---	---	*	*	---		One of the recent Canadian hybrids. Little grown in this State. Bears profusely.
7	*	---	*	*	---		It is yet one of the best in localities where the season is long enough to ripen it. Good two years out of three at the south.
8	---	*	---	**	---		Very early, vigorous and productive. Valuable chiefly as an early market grape.
9	*	*	*	*	*		Is seldom good or even passable till ripened by frost. Fruit best on high, warm, gravelly soils.
10	**	**	**	**	**		Here, as elsewhere, this is "the grape for the million," since it can take care of itself.
11	---	---	---	*	---		Seedling from Concord by E. W. Bull. Prized in Lenawee county.
12	*	*	*	*	*		Possibly from defect of the bloom, this is a bad setter and a thin bearer.
13	**	**	**	**	**		Slow grower. Fully as productive as Concord when well established. Fruit sometimes fails from dropping of the leaves.
14	*	*	*	*	---		Vigorous, healthy, promising.
15	*	*	*	*	*		Rather foxy, with a thick tough skin. One of the best keepers. A thin bearer on strong soils. Better on dry, warm soils.
16	---	---	---	*	---		Very large in both bunch and berry—market.
17	---	---	---	*	---		Better in a more southern latitude.
18	---	†	---	*	---		Promises well for both dessert and market.
19	---	---	---	*	---		A fair variety for dessert and market uses. Rather liable to mildew.
20	*	*	*	*	*		A good dessert grape. May in some localities do for market. It seems to lack constitution.
21	---	---	---	*	---		Worthy of trial.
22	---	---	---	*	---		Rather late for even Southern Michigan.
23	*	*	*	*	*		Still prominent as one of the hardiest and most productive for early market; but very liable to drop its berries.
24	---	†	---	*	---		Vigorous, hardy. Of fine quality.
25	---	---	---	*	---		Another of the Massachusetts hybrids, needing more extensive trial.
26	*	**	*	*	**		Generally esteemed as the finest of our natives. The vine seems to lack constitution, and is not generally successful.
27	*	*	*	*	---		An old favorite. Still popular where it is sure to ripen. Is not generally successful.
28	*	*	*	*	*		A good early sort, with tender, breaking pulp, and fair flavor. Requires warm soils.
29	*	*	*	*	*		Valued for hardiness, vigor and productiveness. A good wine grape.
30	---	---	---	*	*		New, hardy, and vigorous. Three weeks earlier than Concord.
31	---	†	---	†	---		Vine hardy, productive. Not satisfactory in some localities.
32	---	---	---	*	---		Promising early dessert grape.

SECTION IX.—GRAPES—CONTINUED—NATIVE.

Number.	Names.	Descriptions.								Use and value. Scale 1 to 10.		
		Size.		Form.		Color.	Quality.	Season.	Origin.	Dessert.	Cooking.	Market.
		Bunch.	Berry.	Bunch.	Berry.							
33	Kalamazoo	l	l	l o	r	r	v g	e Sept	Ohio?	6	---	6
34	Lady	m	l	l c	r	y g	b	m Sept	Ohio.	10	---	5
35	Lady Washington	v l	m	sh c	r	y	g	e Sept	N. Y.	7	---	---
36	Lindley, <i>Rog. 9</i>	m	m	l c	r	r	v g	m Sept	h Mass.	7	---	8
37	Martha	m	l	sh o	r	y g	g	m Sept	Mo.	4	---	6
38	Massasoit, <i>Rog. 3</i>	m	l	s sh	r	r	g	m Sept	h Mass.	6	---	5
39	Merrimac, <i>Rog. 19</i>	l	l	s b c	r	b	g	m Sept	h Mass.	7	---	7
40	Michigan	m	m	---	m	---	v g	---	Mich.	8	---	---
41	Mills	---	---	---	---	b	v g	---	N. Y.	8	---	---
42	Moore Early	l	l	c sh	r	b	v g	b Sept	Mass.	7	6	7
43	Moyer	s	s	c sh	r	w	v g	b Sept	Ont.	9	---	---
44	Niagara	l	m	c sh	r	g y w	v g	m Sept	N. Y.	8	---	10
45	Perkins	m	m	sh c	r o	r	g	e Sept	Am.	2	---	2
46	Pocklington	l	l	l sh	r	y	v g	e Sept	N. Y.	7	---	8
47	Requa, <i>Rog. 28</i>	l	l	s o	r	r	g	m Sept	h Mass.	7	---	---
48	Salem, <i>Rog. 53</i>	l	l	s b c	r	d r	g	e Sept	h Mass.	7	---	8
49	Telegraph, <i>Christine</i>	l	l	c	r	b	g	m Sept	Penn.	5	---	5
50	Ulster	l	l	sh	r	r	b	m Sept	N. Y.	10	---	---
51	Vergennes	m	l	o s	r	r	v g	b Sept	Ver.	7	---	---
52	Victor	s	s	c sh	r	b	v g	b Sept	Kan.	9	---	---
53	Walter	m	m	sh c	r	l r	b	m Sept	N. Y.	6	---	4
54	Wilder, <i>Rog. 4</i>	l	l	c sh	r	b	v g	m Sept	h Mass.	7	---	8
55	Winchell	m	m	sh	r	w	b	m Sept	Ohio?	10	---	---
56	Woodruff	s b	l	sh	r	r	v g	m Sept	Mich.	7	---	9
57	Worden	l	l	c sh	r	b	v g	m Sept	N. Y.	8	---	10
58	Wyoming	s	m	c	m	b r	v g	m Sept	N. Y.	8	---	---

SECTION IX.—GRAPES—CONTINUED—NATIVE.

Number.	Locality					Remarks.
	East.	Center.	South.	Southern Lake Shore.	Northern Lake Shore.	
33	---	*	---	*	---	Succeeds at Kalamazoo. Not extensively planted.
34	---	**	---	†	---	Seedling of Concord, and as hardy and healthy; but not as vigorous and productive. Quality superior.
35	*	*	*	*	---	Valuable in locations where it will ripen.
36	---	---	*	*	*	A vigorous and productive vine. But little grown in this State.
37	*	*	*	*	*	Much sought for on account of its color. Very sweet, but too foxy.
38	*	*	*	*	*	Moderately vigorous and productive; like most of the hybrids, liable to mildew.
39	*	**	*	*	**	Vigorous and prolific. Much like Wilder in quality and season.
40	---	---	---	*	---	Worthy of extensive trial.
41	*	*	*	*	---	A good dessert grape. May prove profitable.
42	*	*	*	*	*	Vigorous grower. Excellent; especially for the north.
43	---	---	---	*	---	Much like Delaware, but less sprightly in flavor.
44	*	*	*	*	*	A promising white, market grape. Very vigorous, healthy and productive.
45	*	*	*	*	*	Not largely planted here. Hardy, good bearer, but lacks quality. Will do for market.
46	*	*	*	*	---	Hardy, beautiful. Rather late.
47	---	---	---	*	*	Promising here, but requires further trial.
48	*	**	*	*	**	The largest, most attractive and popular of the Rogers hybrids. Vigorous, productive. Bunches often imperfect. Mildews.
49	---	*	---	*	---	Hardy and vigorous. Ripening with Hartford and similar in quality.
50	---	†	---	†	---	Hardy, productive. Promises superior excellence.
51	*	*	*	*	*	Hardy. Ripens with Concord. Not of high quality.
52	---	---	---	*	---	A promising very early dessert variety.
53	*	*	*	*	*	A cross of Delaware and Diana. Has not realized the anticipations of planters. A feeble plant.
54	*	*	*	*	**	One of the finest and most popular of the Roger's hybrids. Will do for market.
55	---	---	---	*	---	The finest of the white grapes. Claimed to be identical with Green Mountain.
56	*	*	*	*	*	Hardy, vigorous. A promising market grape.
57	*	**	*	*	*	A week earlier than Concord and better in quality. Very desirable.
58	*	*	*	*	*	Not new, but showy and desirable.

SECTION X.—GRAPES—FOREIGN.

Foreign grapes are recommended strictly for cultivation under glass; and as, when thus situated, they may be considered as, for all practical purposes, independent of climate; and as they are, moreover, thus grown mainly, if not wholly, for dessert purposes, we have merely copied the list recommended by the American Pomological society, with the accompanying descriptions, omitting any further tabulations.

Number.	Names.	Descriptions.			
		Color.	Flavor.	Season.	Vinery.
1	Barbarossa, <i>Prince Albert, Brizola</i>	Black.	Sweet.	Very late.	Hot.
2	Black Champion	Black.	Sweet.	Early.	Cold.
3	Black Damascus	Black.	Sweet.	Late.	Cold.
4	Black Frontignan	Black.	Muscat.	Late.	Cold.
5	Black Hamburg	Black.	Sweet.	Medium.	Cold.
6	Black Prince	Black.	Sweet.	Medium.	Cold.
7	Black July	Black.	Sweet.	Early.	Cold.
8	Bowood Muscat	White.	Muscat.	Medium.	Hot.
9	Buckland Sweetwater	White.	Sweet.	Medium.	Cold.
10	Calabrian, <i>Calabrian Raisin</i>	White.	Sweet.	Late.	Cold.
11	Cannon Hall Muscat	White.	Muscat.	Late.	Hot.
12	Chasselas Musque or Joslin's St. Albans	White.	Muscat.	Early.	Hot.
13	Duke of Magenta..... <i>Muscat Blanc Hative?</i>	Black.	Sweet.	Early.	Hot.
14	Golden Hamburg, <i>Stockwood Golden Hamburg</i>	White.	Sweet.	Late.	Hot.
15	Golden Champion	Amber.	Sweet.	Medium.	Hot.
16	Grizzly Frontignan, <i>Red Frontignan, Red Constantia</i>	Red & yellow	Muscat.	Medium.	Hot.

SECTION XI.—NECTARINES.

ABBREVIATIONS FOR THIS SECTION.

Form.		Color.		Flowers.	Glands.
c. compressed.	ov. oval.	c. crimson.	r. red.	l. large.	g. globose.
d. depressed.	r. round.	g. greenish.	y. yellow.	s. small.	r. reniform.
o. oblong.		o. orange.	w. white.		s. serrate.

Number.	Names.	Descriptions.									Use and value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Flowers.	Glands.	Adhesion.	Season.	Origin.	Dessert.	Cooking.	Market.
1	Boston	l	rov	gr	vg	s	g	f	b Sept.	Mass.	6	---	---
2	Downton	l	rov	gr	vg	s	r	f	e Aug.	Eur.	8	---	---
3	Early Newington	l	rov	gr	vg	l	s	c	b Sept.	Am.	10	---	---
4	Early Violet	l	rov	ygr	vg	s	r	---	b Sept.	Eur.	10	---	---
5	<i>Violette Hative.</i> Elruge	m	rov	gr	vg	s	r	f	b Sept.	Eur.	9	---	---
6	Red Roman	l	rd	gyr	vg	l	r	c	m Sept.	Eur.	8	---	---
7	Stanwick	l	gwr	or	g	---	r	---	e Sept.	Eur.	8	---	---
8	Victoria	l	rd	gyc	vg	s	r	---	b Sept.	Eur.	9	---	---

SECTION X.—GRAPES—CONTINUED.—FOREIGN.

Number.	Names.	Descriptions.			
		Color.	Flavor.	Season.	Vinery.
17	Gros Colman	Purple.	Sweet.	Late.	Cold.
18	Lady Downes	Black.	Sweet.	Very late.	Hot.
19	Muscat of Alexandria	White.	Muscat.	Late.	Hot.
20	Muscat of Hamburg	Black.	Muscat.	Medium.	Hot.
21	Mrs. Pince's Muscat	Black.	Muscat.	Late.	Hot.
22	Queen of Nice	White.			
23	Red Chasselas, <i>Rose Chasselas</i>	Red.	Sweet.	Medium.	Hot.
24	Red Lombardy	Red.	Sweet.	Medium.	Hot.
25	Rio Virgin				
26	Royal Muscadine	White.	Sweet.	Early.	Cold.
27	Silver Frontignan, <i>Early Silver Frontignan</i>	White.	Muscat.	Early.	Hot.
28	White Nice	White.	Sweet.	Late.	Hot.
29	West St. Peter's	Black.	Sweet.	Very late.	Hot.
30	Wilmot's Hamburg, <i>Dutch Hamburg</i>	Black.	Sweet.	Medium.	Hot.
31	White Sweetwater, <i>Dutch Sweetwater, etc.</i>	White.	Sweet.	Early.	Cold.
32	White Frontignan, <i>White Constantia Muscat Blanc</i>	White.	Muscat.	Medium.	Hot.
33	Zinfindal	Black.	Sweet.	Medium.	Hot.

SECTION XI.—NECTARINES.

The Nectarine is so peculiarly subject to the depredations of the curculio, that it is little grown, except by amateurs, and for dessert uses. Hence experience with it is extremely limited; and for these reasons we only express the comparative values of the varieties in the column for dessert. This fruit, in common with the almond and the peach, is liable to the killing of the fruit buds in severe winters, except in favorable localities. The starring is given with little regard for this fact.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern lake shore.	Northern lake shore.	
1	---	---	---	*	*	Originated at Boston. Large, showy, not of high quality.
2	---	---	---	*	*	Intermediate between Elruge and Early Violet.
3	---	---	---	*	*	Like the serrate peaches, the foliage sometimes mildews. Excellent.
4	---	---	---	*	*	Hardy, productive; fruit delicious.
5	---	---	---	*	*	An old but highly esteemed variety.
6	---	---	---	*	*	Old, one of the richest and best of the clings. Productive.
7	---	---	---	*	*	A comparatively recent, and very highly praised variety.
8	---	---	---	*	*	A cross of Stanwick upon Early Violet, by the late Thomas Rivers. One of the best.

SECTION XII.—PEACHES.

ABBREVIATIONS FOR THIS SECTION.

Form.
c. compressed.
d. depressed.
o. oblong.

ov. oval.
r. round.

b. bright.
c. crimson,
d. dark.
g. green.
o. orange.

Color.
p. purple.
r. red.
w. white.
y. yellow.

Flowers.
l. large.
s. small.

Glands.
g. globose.
o. obscure.
r. reniform.
s. serrate.

Number.	Names.	Descriptions.									Use and value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality	Flowers.	Glands.	Adhesion.	Season.	Origin.	Dessert.	Cooking.	Market.
1	Alberge	m	r	y p r	g	s	g	f	e Aug	Fr.	6	---	8
2	Alexander	m	r	g w r	v g	l	g	c f	e July	Ill.	9	---	9
3	Amsden	m	r	g w r	v g	l	g	c f	e July	Mo.	9	---	9
4	Atlanta	m	r c	w p r	b	s	r	f c	e Sept	N. H.	10	10	7
5	Barnard	m l	r	y d r	g	s	r o	f	b Sept	Am.	7	7	9
6	Beatrice	s	r c	w r	v g	l	r	f	m Aug	Eng.	8	---	7
7	Bergen	l	r d	o d r	b	s	r	f	b Sept	Am.	9	---	5
8	Briggs May	m l	r	g w r	v g	---	s	f	e July	Cal.	9	---	4
9	Cole	m	r	w d r	v g	s	g	f	e Aug	Am.	7	---	5
10	Columbia	l	r d	r	v g	s	r	f	m Sept	Am.	6	---	4
11	Coolidge	l	r	w c	v g	s	g	f	m Aug	Mass.	9	---	7
12	Cooner	l	---	---	---	---	---	---	---	Mich.	---	---	---
13	Crawford, Early	l	o	y r	v g	s	g	f	e Aug	N. J.	9	10	10
14	Crawford, Late	v l	r	y d r	v g	s	g	f	e Sept	N. J.	7	10	10
15	Delavan	l	r o	w r	g	s	r	f	b Oct	Am.	6	7	7
16	Downing	s	r d	g w r	v g	l	s	f c	e July	Penn.	8	6	6
17	Druid Hill	l	r	g w r	b	s	g	f	e Sept	Md.	10	---	7
18	Dumont	l	r	d y r	g	s	r	f	m Sept	Mich.	8	7	10
19	Early Admirable	m	r	y w r	v g	l	g	f	e Aug	Fr.	8	---	3
20	Early Newington free	l	r c	y w r	b	s	g	f	e Aug	Am.	10	---	7
21	Early York	m	r o	g w r	v g	l	s	f	e Aug	N. J.	8	---	---
22	Foster	l	r d	d o r	v g	s	g	f	e Aug	Mass.	8	8	9
23	George the Fourth	m	r	y w d r	b	s	g o	f	e Aug	N. Y.	10	---	5
24	Golden Drop	m l	r o v	b y	v g	---	---	f	e Sept	Mich.?	7	9	10
25	Grosse Mignonne	l	r d	g y p r	b	l	g	f	e Aug	Enr.	10	9	6
26	Haines	m	r d	w r	g	s	g	f	e Aug	N. J.	6	---	7
27	Hale	m	r	g w r	v g	l	g	f c	m Aug	Ohio.	10	---	9
28	Heath cling	l	o o v	y w r b	v g	s	r	c	b Oct	Md.	9	9	7
29	Hill Chili	m	o v c	y d r	g	l	r	f	e Sept	N. Y.	6	8	9
30	Imperial	m l	r c d	y w r	v g	s	g	f	b Sept	N. Y.	7	10	7
31	Jacques	l	r c	d y r	v g	s	r	f	m Sept	Mass.	7	9	9
32	Keyport	l	r	w c	g	s	r	f	b Oct	Am.	6	7	8
33	Lady Palmertson	m l	r	y d r	g	s	r	f	e Sept	Eng.	6	9	9
34	Large Early York	m l	r	w r	v g	s	g	f	b Sept	Am.	8	8	8

SECTION XII.—PEACHES.

Since the peach is generally used in its fresh state, or for canning, which is only a mode of preserving in a nearly fresh condition, we have generally omitted to give values in the column headed "cooking." Throughout Central Michigan, except in favorable localities, occasional severe winters prove fatal to the fruit buds of the peach, and sometimes even to the trees. These facts cannot be properly expressed in the starring, and hence are disregarded.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern Lake shore.	Northern Lake shore.	
1	*	*	*	*	*	This is one of the earliest of yellow-fleshed peaches, and only desirable for that reason.
2	*	*	*	*	*	A partial cling, much like its supposed parent, Hale, and two or three weeks earlier. Profitable for market.
3	*	*	*	*	*	Almost exactly like Alexander in tree, fruit, and season of ripening.
4	*	*	*	*	*	Of the finest quality. Not a market fruit.
5	*	**	**	**	**	When thoroughly thinned, the size is large, often overbears, becoming small.
6	*	*	*	*	*	As far as tried, it is too small for the market, although some esteem it profitable. Rich, beautiful.
7	*	*	*	*	---	Lacks productiveness.
8	*	*	*	*	*	An exceedingly beautiful peach, but, like all serrate varieties, liable to mildew of the foliage.
9	*	*	*	*	*	This has been elbowed aside, the markets craving yellow peaches.
10	---	---	---	*	---	Lacks productiveness, and is not attractive in appearance.
11	*	*	*	*	*	One of the best pale-fleshed, early market peaches.
12	---	---	---	*	---	Grown and valued for market in Allegan county.
13	**	**	*	**	*	Very popular with both market men and fruitgrowers. Much used for canning. Others often sell under this name. Bloom tender.
14	*	**	*	*	*	Lacks productiveness on light soils, and on young trees. Many place it first for profit.
15	---	---	---	*	---	Is liked by some planters, but is not generally known or valued.
16	*	*	---	*	---	Mildews, hence less desirable. Scarcely earlier than Amsden.
17	*	*	*	*	---	An excellent late pale-fleshed peach that should be better known.
18	---	---	---	*	---	Tree and buds hardy. Shipping qualities best.
19	*	---	---	*	---	Mainly valuable for the private garden.
20	*	*	*	*	*	Sometimes clings slightly. A fine amateur peach. Fruit large and beautiful.
21	*	*	*	*	*	Very profitable at Lawton. Its liability to mildew is its most serious drawback.
22	---	*	---	*	*	A good market peach, but almost identical in season with Early Crawford.
23	*	*	*	*	*	One of the best for home use. Too tender and delicate for market.
24	---	---	---	*	---	Probably an unrecognized old variety.
25	*	*	*	*	*	The true variety is one of the most delicious of peaches.
26	*	*	*	*	*	Hardy and productive. Well adapted to the market.
27	*	**	*	**	**	A fine peach and a vigorous tree. Sometimes rots before maturity. By many highly esteemed for market. A semi-cling.
28	*	*	*	*	*	One of the finest clings, but needs a long season in this latitude. Very profitable when it ripens fully.
29	*	*	*	**	*	Hardy; a good bearer and a profitable late variety on young trees. Lacks quality. Losing reputation.
30	*	*	*	*	*	Valued for drying, canning and preserving.
31	*	**	*	**	*	Profitable, but not of high quality.
32	*	*	*	*	---	Does not mature perfectly in unfavorable seasons. Surer on light soils.
33	---	---	---	*	---	Originated by the late Thomas Rivers. Promising.
34	*	**	*	*	*	Has not become generally popular in Michigan.

SECTION XII.—PEACHES—CONTINUED.

Number.	Names.	Descriptions.									Use and value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Flowers.	Glands.	Adhesion.	Season.	Origin.	Dessert.	Cooking.	Market.
35	Large White cling	l	r	w br	vg	s	g	c	m Sept.	N. Y.	8	9	9
36	Late Admirable	vl	rov	y gr	b	s	g	f	m Sept.	Fr.	10	---	8
37	Late Red Rareripe	l	rov	y r	b	s	g	f	m Sept.	Am.	10	---	6
38	Louise	m	rc	g w p r	vg	s	r	f	b Aug.	Eng.	8	---	8
39	Lemon cling	l	o	y r	vg	s	r	c	e Sept.	Am.	6	7	8
40	Lewis	l	r	w r	g	---	---	f	e Aug.	Mich.	7	---	8
41	Macon [local]	---	---	---	---	---	---	f	---	Mich.	8	---	---
42	Moore	l	rov	w r	vg	s	g	f	b m Sept.	Mass.	8	6	8
43	Morris White	m	ov	g w p	vg	s	r	f	e Sept.	Am.	7	10	8
44	Mountain Rose	l	rc	w r	vg	s	g	f	b Sept.	N. J.	7	---	10
45	Nonpareil	l	rov	y r	vg	s	g	f	m Sept.	Am.	8	---	8
46	Oblong	l	ro	y r	g	s	r	f	e Sept.	Am.?	5	8	8
47	Oldmixon cling	l	rov	y w r	b	s	g	e	m Sept.	Am.	8	9	7
48	Oldmixon free	l	rov	y w r	vg	s	g	f	m Sept.	Am.	8	8	10
49	President	l	rov	g r	vg	s	g	f	m Sept.	N. Y.	9	---	---
50	Pullen	l	ov	y r	vg	s	g	f	m Sept.	N. J.	6	8	8
51	Reeves Late	vl	rov	y r p	vg	s	g	f	Sept. Oct.	N. J.	---	10	10
52	Red Cheek	l	rov	y br	g	s	g	f	m Sept.	Am.	7	---	8
53	Richmond	ml	rc	y dr	vg	s	r	f	b Sept.	N. Y.	8	9	9
54	Rivers	l	r	y pink	b	l	r	f	m Aug.	Eng.	9	9	8
55	Ruding Late	l	rc	w r	g	s	r	f	m Sept.	Am.	8	---	---
56	Saint John	l	rc	y r	vg	---	---	f	b Sept.	Am.	8	---	8
57	<i>Craines Early.</i> Salway	l	rd	y cr	vg	s	r	f	b Oct.	Eng.	8	9	9
58	Silver Medal	m	ro	w	vg	s	g	f	Sept. Oct.	Am.	8	10	10
59	Smock free	l	ov c	o y dr	g	s	r	f	Oct.	N. J.	6	9	10
60	Snow	m	r	w	g	s	r	f	m Sept.	Am.	5	10	5
61	Snow Orange	ml	r	b y dr	vg	s	r	f	b Sept.	Mich.	6	7	9
62	Steadley	l	rov	w r	vg	s	r	f	b Oct.	Am.	9	10	---
63	Stump	vl	ro	w br	vg	s	g	f	e Sept.	N. J.	8	8	9
64	Susquehanna	vl	r	y r	vg	s	r	f	m Sept.	Penn.	7	9	7
65	Temple Late	m	o ov	y r	g	---	g	f	m e Sept.	Am.	---	---	---
66	Tippecanoe	vl	rc	y r	vg	s	r	c	e Sept.	Penn.	9	9	9
67	Troth	m	r	w br	g	s	g	f	e Aug.	N. J.	5	---	8
68	Van Zandt	m	ov	w r	b	s	r	f	e Aug.	N. Y.	10	---	5
69	Variegated	l	r	w c p	b	s	g	f	e Sept.	N. J.	10	9	6
70	Wager	m	o ov	y	vg	l	g	f	b Sept.	N. Y.	8	10	10
71	Wheeler early	s	r	w r	g	---	g	fr	b Sept.	Am.	7	---	6
72	Yellow Rareripe	l	ro	o y r	vg	s	g	f	b Sept.	Am.	8	8	8

SECTION XII.—PEACHES—CONTINUED.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern lake shore.	Northern lake shore.	
35	*	*	*	*	*	A large and showy cling of good quality.
36	*	*	*	*	*	One of the finest for home use as a dessert peach.
37	*	*	*	*	*	Highly valued as a dessert peach. Comes before the preceding.
38	*	*	*	*	*	Ripens in advance of Hale or Beatrice. Very high quality. At Lawton said to sell well.
39	*	*	*	*	*	The largest and best of the yellow fleshed clings. Does not sell well.
40	*	*	*	*	*	An Allegan Co. Seedling. A market peach.
41	*	*	*	*	*	Valued in northeastern Lenawee.
42	*	*	*	*	*	A beautiful and promising peach. May be valuable for market if productive.
43	*	*	*	*	*	Valued for preserving and canning on account of its color.
44	*	*	*	*	**	A valuable market variety. Highly prized where fully proved.
45	*	*	*	*	*	A variety originating from Old Red Cheek, and promising to be superior.
46	*	*	*	*	*	Promising market peach. Received from Pennsylvania under this name. Origin and history unknown.
47	*	*	*	*	*	Where a cling is desired, this is one of the finest of its season.
48	*	*	*	**	**	A very old variety, which still holds a high position as a market peach.
49	*	*	*	†	*	One of the finest amateur varieties.
50	*	*	*	*	*	Originated many years since by the late Isaac Pullen. Somewhat grown at Douglas, Allegan county.
51	*	*	*	*	*	Much like Early Crawford, and more desirable where it will ripen with certainty.
52	*	*	*	*	*	An old sort. The parent of Crawford's Early and Late.
53	*	*	*	*	*	A new and valuable variety. A few days later than Early Crawford, and less acid.
54	*	*	*	*	*	An excellent very early sort; lacks color. Fruit large and beautiful. At Lawton very profitable.
55	*	*	*	*	*	Promising amateur peach. Adaptation to market yet undetermined.
56	*	*	*	*	*	Identical with Flaters St. John, Craines Early and Yellow St. John.
57	*	*	*	*	*	Will only ripen at the south with certainty; fails in unfavorable seasons.
58	*	*	*	*	*	The finest of canning peaches, without either red or brown at the pit. Occasionally a faint red cheek.
59	*	*	*	**	*	One of the latest profitable market peaches in Southern Michigan. Valuable.
60	*	*	*	*	*	Young growth yellowish green. Fruit clear, yellowish white; flesh clear white.
61	*	*	*	**	**	Similar to Barnard; brighter in color, and slightly later. Must be thinned to insure good size.
62	*	*	*	*	*	Excellent for either dessert or canning.
63	*	*	*	*	*	A large and beautiful market peach of fair quality. Very profitable.
64	*	*	*	*	*	A large, beautiful and fine, rather late peach. Lacks productiveness.
65	*	*	*	*	*	Good; but very little grown.
66	*	*	*	*	*	One of the finest late yellow clings; for Southern Michigan.
67	*	*	*	*	*	An early and productive white fleshed peach of only medium quality.
68	*	*	*	*	*	Skin very smooth and beautiful. A fine amateur peach.
69	*	*	*	*	*	A beautiful and superior peach, originating with the late Isaac Pullen, of New Jersey.
70	*	*	*	*	*	Said to be the most profitable variety in Mason county.
71	*	*	*	*	*	A market variety, now nearly out of cultivation.
72	*	*	*	*	*	The genuine is a fine early peach. The one grown here is probably spurions.

SECTION XIII.—PEARS.

ABBREVIATIONS FOR THIS SECTION.

Form.

a. acute.
d. depressed.e. elongated.
o. oblong.ob. obtuse.
obo. obovate.ov. oval or ovate.
p. pyriform.r. roundish.
t. turbinate.

Number.	Names.	Descriptions.						Use and value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Season.	Origin.	Dessert.	Cooking.	Market.
1	Ananas D'Ete	l	p ob	y b ru	v g	Sept. Oct.	Holl.	10	5	6
2	Angouleme, <i>Duchess</i>	v l	o obo	g y ru	v g	Oct.	Fr.	7	9	10
3	Anjou	l	ob p	g ru c b	v g	Nov.	Fr.	9	9	10
4	Bartlett	l	o ob p	y ru r	v g	Sept.	Eng.	8	10	10
5	Bloodgood	m	t obo	y ru	v g	Aug.	N. Y.	9	6	4
6	Bosc	l	p	d y ru r	b	Oct.	Bel.	9	8	9
7	Boussock	l	obo p	d y ru	v g	Sept. Oct.	Bel.	7	7	9
8	Brandywine	m	e ob p	y g ru r	v g	b Sept.	Penn.	7	7	5
9	Brignais, <i>Des Nonnes</i>	m	r ob	g y	v g	Sept.	-----	6	6	4
10	Buffum	m	ob obo	d y r	v g	Sept.	R. I.	6	7	6
11	Clairgeau	l	p	y oc ru	g	Oct. Nov.	Fr.	6	7	9
12	Clapp Favorite	l	obo ob p	l e y	v g	Sept.	Mass.	8	8	9
13	Columbia	l	o obo	g y o	g	Nov. Jan.	N. Y.	7	8	6
14	Comice, <i>Doyenne du Comice</i>	l	r ob p	y e ru	b	Oct. Nov.	Fr.	9	7	7
15	Dana Hovey	s	obo ob p	g y ru	b	Nov. Jan.	Mass.	9	5	5
16	Dearborn	s	r p	l y	v g	Aug.	Mass.	7	5	3
17	Diel	l	obo ob p	y o ru b	v g	Sept. Dec.	Bel.	6	8	7
18	Dix	l	l p	d y ru	v g	Oct. Nov.	Mass.	8	6	5
19	Easter Beurre	l	r obo ob	y g ru b	v g	Jan. March.	Eur.	6	8	3
20	Emile d'Heyst	l	o obo p	y o ru	b	Nov. Dec.	Bel.	10	8	8
21	Epine Dumas	m	obo ob p	g y ru b	v g	Nov. Dec.	-----	7	6	5
22	Flemish Beauty	l	obo ob p	y ru r b	v g	Sept.	Bel.	7	7	8
23	Giffard	m	p	g y r	v g	e Aug.	Fr.	10	6	6
24	Glout Morceau	l	obo ob p	g y b	g	Dec.	Fr.	7	7	5
25	Gray Doyenne	m	o obo	l ru	b	Oct.	Eur.	9	8	8
26	Gris D'Hiver Nouveau	m	r ob p	y ru	v g	Nov. Jan.	Eur.	6	8	6
27	Hardy	l	obo ob p	g ru b	v g	Sept. Oct.	-----	7	7	8
28	Howell	l	r p	l y ru	v g	Oct.	Conn.	8	7	8
29	Josephine of Malines	m	r ob p	g y ru	v g	Jan. Feb.	Bel.	6	7	8
30	Kieffer	l	r ob p	y r	g	Nov.	Am.	1	7	7
31	Kirtland	m	ob obo p	y l ru r	v g	b Sept.	Ohio.	8	5	4

SECTION XII.—PEARS.

ABBREVIATIONS FOR THIS SECTION.

		Color.		
b. brown.	d. dark.	l. light.	r. red.	y. yellow.
c. crimson.	g. green.	o. orange.	ru. russet.	

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern Lake Shore.	Northern Lake Shore.	
1	*	*	*	*	*	A fine amateur variety.
2	*	*	*	*	*	When neglected proves unproductive. Profitable under good treatment, and on dwarf stocks. At north loses quality.
3	**	**	**	**	*	One of the best late autumn pears, whether for market or home use.
4	**	**	**	**	**	The leading market sort. Too musky to suit some tastes.
5	*	*	*	*	*	No garden should be without this. Fruit best when house-ripened.
6	*	*	*	*	*	Fruit fair and even in size. Will bear to be planted for market.
7	*	*	*	*	*	Popular as a market pear. Also a good amateur fruit.
8	*	*	*	*	*	But little disseminated. A good early amateur pear.
9	*	---	---	---	---	Not much disseminated. Valued in Lenawee county.
10	*	*	*	*	*	Popular on account of the health, vigor, and productiveness of the tree.
11	*	*	*	**	*	Market. Soon becomes dry and insipid, after ripening. A showy market pear.
12	*	**	*	*	*	A strong grower. Fine large fruit. Inclined to rot at the core. A good market pear if gathered early.
13	*	*	---	---	---	Liable to drop or be blown from the tree prematurely.
14	*	---	---	*	---	New; gives promise of value.
15	*	*	---	*	---	One of the few winter pears of high quality.
16	*	*	*	*	*	Well known and esteemed, but too small to become very popular.
17	*	*	*	*	*	Fruit apt to be astringent on young trees. Should be house-ripened.
18	*	*	*	*	*	Too tardy bearer; hence is rarely planted.
19	*	*	*	*	*	In a warm exposure and favorable season, this will be found satisfactory.
20	*	---	---	*	---	Better south. Little disseminated. A fruit of high quality.
21	*	---	---	*	---	Tree vigorous; fruit lacks attractiveness and quality.
22	**	**	**	*	**	Vigorous tree. Large, showy fruit, which decays soon at the center. Drops, and sometimes scabs or spots.
23	*	*	*	*	*	Fruit requires to be gathered before maturity—decays rapidly.
24	*	*	*	*	*	On old trees, when well ripened, this is an excellent pear.
25	*	*	*	*	*	Excellent. Should be more widely planted.
26	*	---	---	---	---	A promising winter pear.
27	*	*	---	*	---	Nor as well known as it should be.
28	*	*	*	*	*	Quite freely planted and generally esteemed.
29	*	*	*	*	*	Not as freely planted as it should be.
30	*	*	*	*	---	In this climate only valued for market and canning; and that only at the south.
31	*	*	*	*	---	Very fine, but comes in the height of the fall fruit season. Only amateur.

SECTION XIII—PEARS.—CONTINUED.

Number.	Names.	Descriptions.						Use and value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Season.	Origin.	Dessert.	Cooking.	Market.
32	Langelier	m	obo ob p	y c ru	v g	Nov. Jan.	Eng.	6	8	7
33	Lawrence	m	obo ob p	y ru	v g	Dec.	N. Y.	6	8	8
34	Le Conte	l	ob p	y	g	Aut.	Am.	1	4	4
35	Louise Bonne (of Jersey)	l	o p	g b r	v g	Sept. Oct.	Fr.	7	9	8
36	Lucrative	m	obo ob p	y g ru	b	Sept.	Fr.	10	8	8
37	<i>Eondante d'Automne.</i> Madeleine	m	obo p	y g b	v g	July.	Fr.	8	8	7
38	Manning Elizabeth	s	obo ob p	l y r	v g	Aug. Sept.	Bel.	9	7	6
39	Mount Vernon	m l	r ob p	ru y b r	v g	Nov. Dec.	Mass.	8	8	6
40	Napoleon	l	ob p	y g	g	Sept.	Bel.	5	6	6
41	Onondaga	l	obo ob p	y ru	v g	Oct. Nov.	Conn.	7	8	9
42	Osband (Summer)	s	r ov ob op	y r ru	v g	Aug.	N. Y.	7	7	8
43	Oswego	m	ob obo	y g ru	v g	Oct. Nov.	N. Y.	8	8	4
44	Paradise (of Autumn)	l	o obo a p	y ru	v g	Sept. Oct.	Bel.	8	6	4
45	Pound	l	p	y g b	g	Dec. Mar.	Eur.?	1	8	7
46	Reeder	s m	r ob p	y ru	b	Nov.	N. Y.	9	8	5
47	Rostiezer	s	obo o p	y g r b	b	Aug.	Eur.	9	5	6
48	Seckel	s	obo	y b r ru	b	Oct.	Penn.	10	---	7
49	Sheldon	m	r ob obo	g y ru c	v g	Oct.	N. Y.	8	8	9
50	Souvenir du Congres	l	p r	y g	v g	Sept.	Fr.	8	8	9
51	Sterling	m	r ov p	y ru c	v g	Sept.	N. Y.	7	5	9
52	Stevens	l	r	y	v g	Sept.	N. Y.	9	6	6
53	St. Ghislain	m	p	y	g	Sept. Oct.	Bel.	7	6	4
54	Summer Doyenne	s	r obo p	y r	v g	July.	Bel.	9	5	9
55	<i>Doyenne d'Ete.</i> Superfin	m	r p	y c ru	v g	Oct.	Fr.	7	8	8
56	Tyson	m s	a p	y ru c	b	Aug. Sept.	Penn.	9	6	8
57	Urbaniste	m l	obo p	y ru	v g	Oct. Nov.	Fl.	9	7	6
58	Vicar	l	l p	y b	g	Nov. Jan.	Fr.	2	8	6
59	Washington	m	o obo	y r	v g	Sept.	Del.	9	6	6
60	White Doyenne	m l	obo	y r	b	Oct.	Fr.	10	7	7
61	Windsor	l	p	y g	g	Aug.	Eur.	1	5	6
62	Winter Nelis	m	r obo	y g ru	b	Dec. Jan.	Fl.	9	7	7

SECTION XIII.—PEARS—CONTINUED.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern Lake Shore.	Northern Lake Shore.	
32	*	---	---	*	---	Like winter pears generally, this has not been largely planted.
33	*	*	*	*	*	Tree healthy and vigorous. Should be grown on dry, warm soils.
34	---	---	†	---	---	Tree vigorous. Fruit large. Quality poor at the north. Better south.
35	*	*	*	**	**	A good market pear. Should always be grown as a dwarf.
36	*	*	*	*	*	An excellent and profitable old variety.
37	*	*	*	*	---	The earliest pear of good quality. Sometimes slightly astringent.
38	*	*	*	*	---	One of the most desirable amateur pears of its season.
39	---	*	---	*	*	A promising late autumn and early winter pear. Bears young.
40	*	*	*	*	---	An early and abundant bearer. Lacks quality.
41	*	**	*	**	*	A good, constant bearer of large, showy fruit of fair quality in most seasons.
42	*	*	*	*	*	Tree vigorous, productive. Fruit sufficiently good for the market.
43	*	*	*	*	---	High vinous flavor; rich. Becomes productive with high culture.
44	*	---	---	---	---	Fruit somewhat like Beurre Bosc, but more variable.
45	*	*	*	*	---	Chiefly valued for the kitchen. Trees, strong, healthy.
46	*	*	---	*	---	A New York seedling from Winter Nelis.
47	*	*	*	*	*	Tree vigorous and productive. Fruit excellent, but unattractive in appearance.
48	*	*	*	*	**	The standard of high quality among pears. Tree forms a beautiful pyramid. Profitable when buyers come to know it.
49	*	**	*	*	**	A hardy, productive tree; and a good fruit for general purposes; not attractive in appearance.
50	---	*	---	*	---	Very large and beautiful. Variable in size. Not of high quality.
51	*	*	*	*	†	Both tree and fruit well adapted for the market.
52	*	*	*	*	*	An excellent and fine looking pear, but soon decays at the core.
53	*	---	---	---	---	An old variety; now to a great extent superseded.
54	*	*	*	**	*	The best and most satisfactory very early pear. Valued for early market.
55	*	*	*	*	---	A fine pear. Sometimes a little too acid. Productive.
56	*	*	*	*	---	A beautiful tree. Fruit grown to some extent for the market. A tardy bearer.
57	*	*	*	*	---	Too tardy a bearer. Is being abandoned; probably for this reason.
58	*	*	*	*	*	Tree very vigorous and productive; its greatest recommendation for this climate. It often fails to ripen well.
59	*	**	*	*	---	This pear should be planted in every garden.
60	*	*	*	*	*	This old favorite is generally successful in this State; but occasionally scabs and cracks.
61	*	*	*	*	*	The vigor and beauty of the tree, and the size of the fruit, are its sole recommendations.
62	*	*	*	*	---	The fruit if well grown and ripened, is scarcely inferior to the Seckel. The tree must not be allowed to overbear.

SECTION XIV.—PLUMS.

In the grading and starring of plums no reference is had to the prevalence of the curculio in the district; nor yet to the tendency of the tree to the premature rotting of the fruit or loss of foliage.

ABBREVIATIONS FOR THIS SECTION.

Form.

d. depressed.
n. necked.ob. oblate.
ov. oval.l. long.
o. oblong.obo. obovate.
r. roundish.

Number.	Names.	Descriptions.							Use and value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Adhesion.	Season.	Origin.	Desert.	Cooking.	Market.
1	Bavay	l	r d	g y	b	f	Oct.	Bel.	9	9	9
2	Bleeker Gage	m	r ov	y	v g	f c	e Aug.	N. Y.	8	7	8
3	Bradshaw	l	ov obo n	r p	g	c f	e Aug.	Am.	7	10	10
4	Canada Egg [local name]	l			g	c	m Aug.	Ont.	7	7	8
5	Coe Golden Drop	l	o v	y	v g	c	e Sept.	Eng.	8	8	9
6	Columbia	l	r	br p	g	f	b Sept.	N. Y.	6	---	5
7	Copper	m s	ov n	c b	g	c	e Sept.	Eur.	4	8	9
8	Damson	s	ov	b p	g	f c	Sept.	Am.	3	10	7
9	Duane Purple	v l	o ov	r p	g	f c	m Aug.	N. Y.	7	4	6
10	General Haud	v l	r ov	g	g	f	Sept.	Penn.?	6	7	7
11	German Prune	l	l ov	b p	g	f	Sept.	Eur.	6	9	9
12	Green Gage	s	r	g y r	b	f	e Aug.	Eur.	10	8	3
13	Huling	v l	r ov	g y	g	c	e Aug.	Penn.	8	7	5
14	Imperial Blue [local]	m	r	b p	v g	c	b Sept.	Mich.	8	9	9
15	Imperial Gage			g y	b	f	b Sept.	N. Y.	9	9	8
16	Italian Prune, <i>Fellemborg</i>	m	ov	b	g	f	b Oct.	Eur.	6	8	8
17	Jefferson	l	ov	y p r	b	f	b Sept.	N. Y.	10	9	9
18	Kirke	m	r o	p	g	f	b Sept.	Eur.	---	---	---
19	Lawrence Favorite	l	r ob	y g	b	f	m Aug.	N. Y.	10	---	---
20	Lombard	m	r ov d	r p	g	c	b Sept.	N. Y.	6	10	10
21	McLaughlin	l	r ob d	y r	b	c	e Aug.	Me.	10	6	7
22	Miner	m	l r	p r	---	c	b Oct.	Penn.	6	6	4?
23	Monroe	m l	ov	g y r	g	---	b Sept.	N. Y.	6	7	9
24	Orleans	m	r	r p	g	f	e Aug.	Eur.	---	---	---
25	Peach	v l	r d	b r	g	f	b Aug.	Eur.	6	10	10
26	Pond; <i>Fonthill</i>	v l	ov n	y r	g	c	m Sept.	Eng.	6	7	9
27	Prince Englebert	l	ob ov	p br	v g	f	b Sept.	Bel.	8	8	10
28	Prince Yellow	m l	ov	y	v g	f	b Aug.	N. Y.	8	8	9
29	Quackenboss	l	o r	p	g	f c	Sept.	N. Y.	6	7	9
30	Red Magnum Bonnm	l	ov	r	g	f	b Sept.	Eur.	5	7	7
31	Smith Orleans	l	ov	r p	v g	c	e Aug.	N. Y.	8	8	8
32	Washington	v l	r ov	g y c	v g	f	e Aug.	N. Y.	8	10	7
33	Wild Goose	m	r ov	p	g	c	e July	Tenn.?	6	5	---
34	Yellow Egg	v	ov	y	g	c	e Aug.	---	6	8	7

SECTION XIV.—PLUMS.

ABBREVIATIONS FOR THIS SECTION.

Color.

b. blue.
c. copper.br. brownish.
y. yellow.p. purple.
r. red.r. red.
g. green.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern Lake Shore.	Northern Lake Shore.	
1	*	*	*	*	*	Nearly or quite as fine as Green Gage. Tree a better grower.
2	*	*	*	*	*	Hardy. A good regular bearer. Shoots downy.
3	*	**	*	**	**	Grows and bears well. A superior market variety.
4	---	*	---	*	**	Probably an unrecognized old variety. Very hardy and productive in Mason county.
5	**	**	**	**	**	Beautiful. Excellent. Perhaps may not ripen with certainty at the extreme north.
6	*	---	---	---	---	Subject to rot. Tree vigorous and productive.
7	---	---	---	*	---	Valued for market and cooking.
8	*	*	*	*	*	A slow grower. Productive. Valued for preserves.
9	*	*	*	*	*	Too soft and uneven in size for market.
10	---	---	---	*	*	Does not succeed well in Mason county.
11	*	*	*	*	**	Valued for drying and preserving.
12	*	*	*	*	*	The standard of quality among plums. Tree a slow grower.
13	*	*	---	*	*	Tree very vigorous, upright, moderate bearer.
14	---	---	*	---	---	Originated in Lenawee county by the late Israel Pennington, who prized it highly.
15	*	*	*	*	*	Productive, excellent; shoots dark, downy, vigorous.
16	---	---	---	*	---	Tree vigorous, spreading, branches smooth.
17	*	*	*	*	**	A slow grower, good bearer, very profitable at the north.
18	---	---	---	*	---	Branches smooth. The stone is broad and flat.
19	*	*	*	*	*	A seedling from Green Gage. Very productive.
20	**	*	**	*	**	Tree vigorous, hardy, and productive. The leading market variety. Tree not satisfactory at St. Joseph.
21	*	*	*	*	*	Nearly or quite equal to Green Gage. Hardy, vigorous, productive.
22	*	*	*	*	*	Comparatively unproductive if standing alone. Very hardy. Of the Americana species.
23	---	---	---	*	*	Tree very vigorous and productive. Slightly tender.
24	---	---	---	*	*	Vigorous. Branches gray and very downy.
25	---	---	---	*	*	Tree upright, vigorous. A moderate bearer.
26	---	---	---	*	**	Productive, vigorous. Branches smooth, grayish. Dorr's Favorite of Oceana county is identical with this.
27	*	---	---	*	**	Tree a great bearer. Valuable for market.
28	*	*	*	*	*	An old favorite. Hardy, productive.
29	*	*	*	*	*	A rapid, upright grower; productive.
30	*	*	*	*	**	The genuine has slender, smooth shoots.
31	*	*	*	*	*	One of the most vigorous; shoots glossy, reddish purple; very productive.
32	*	*	*	*	*	One of the largest and most beautiful, but inclined to rot on the tree. Free from rot at the north.
33	*	*	*	*	*	An uncertain bearer at the north; probably from imperfect pollenization. A variety of the chicasa species.
34	*	*	*	*	**	A fine market variety, but rots in some seasons at the south, and as far north as Mason county.

SECTION XV.—QUINCES.

ABBREVIATIONS FOR THIS SECTION.

Form.
 ob. obtuse p. pyriform. r. round.

Number.	Names.	Description.						Use and value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Season.	Origin.	Dessert.	Cooking.	Market.
1	Angers.....	v l	ob p	y	v g	Oct. Nov.	Eur.	---	9	7
2	Apple, <i>Orange</i>	l	r p	y	v g	Oct. Nov.	Eur.	---	10	10
3	Champion.....	v l	ob p	y	v g	Nov.	Am.	---	8	8
4	Meech.....	l	r ob p	y	v g	Oct. Nov.	N. J.	---	10	10
5	Portugal.....	v l	ob p	y	b	Oct.	Eur.	---	10	5
6	Rea.....	l	r ob p	y	g	Oct.	N. Y.	---	10	10

SECTION XVI.—RASPBERRIES,—*RUBUS OCCIDENTALIS* AND SUPPOSED HYBRIDS;
ROOTING FROM THE TIPS OF THE BRANCHES.

ABBREVIATIONS FOR THIS SECTION.

Form.
 c. conical. ob. obtuse. r. roundish

Number.	Names.	Description.						Use and value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Season.	Origin.	Dessert.	Cooking.	Market.
1	American Black, <i>Doolittle</i>	s	r	b	g	m July.	N. Y.	5	7	7
2	American White.....	s	r	y w	g	m July.	Am.	5	6	4
3	Beebe.....	m	r	y	g	m July.	N. Y.	4	---	3
4	Carman.....	m	r	b	v g	m July.	---	7	7	6
5	Caroline.....		r	o	v g	m July.	N. Y.	9	9	6
6	Cromwell.....	m	r	b	v g	b July.	Conn.	8	7	---
7	Earhart.....	m	r	b	v g	July Oct.	Conn.	9	---	---
8	Florence.....	m	y	o y	g	m July.	Am.	7	8	6
9	Golden Thornless.....	m	r	y	g	July.	Am.	6	6	4
10	Gregg.....	v l	r	b	v g	m July.	Ind.	6	9	10
11	Hilborn.....	v l	r	b	v g	m July.	Ont.	9	9	10
12	Hopkins.....	m l	r	b	g	m July.	Kan.	6	6	8
13	Johnston Sweet.....	m	r	b	g	b July.	N. Y.	4	4	7
14	McCormick, <i>Mammoth Cluster</i> ...	m l	ob c	b	v g	July Aug.	Am.	6	9	9
15	Miami.....	m	r	b p	g	July.	Am.	7	10	7

SECTION XV.—QUINCES.

ABBREVIATIONS FOR THIS SECTION.

Color.
y. yellow.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern lake shore.	Northern lake shore.	
1	*	*	---	*	---	A longer keeper than the Apple, but not equal in quality. Very unproductive at Traverse (Parmelee).
2	**	**	**	**	*	Well known and universally approved.
3	---	---	---	*	---	An early and prolific bearer. Very downy. Very late.
4	---	†	---	†	---	Said to be very productive and of superior quality.
5	*	---	---	---	---	Tree a strong grower, but unproductive. Quality superior.
6	*	---	---	*	---	Larger than the apple and equally good. Tree thrifty.

SECTION XVI.—RASPBERRIES.—*RUBUS OCCIDENTALIS* AND SUPPOSED HYBRIDS;
ROOTING FROM THE TIPS OF THE BRANCHES.

ABBREVIATIONS FOR THIS SECTION.

Color.
b. black. p. purple. r. red. y. yellow.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern lake shore.	Northern lake shore.	
1	*	*	*	*	*	Desirable when great hardiness is required. A little later than Sonhegan.
2	*	*	*	*	*	Fancied for its color, which, however, changes to a dirty brown when overripe.
3	*	*	*	*	*	Productive. When overripe the color is forbidding.
4	*	*	*	*	*	Of medium quality only.
5	---	*	---	*	---	Supposed hybrid between <i>Idæus</i> and <i>Occidentalis</i> . A family berry.
6	---	---	---	*	---	A new and promising early variety.
7	*	*	*	*	*	Fruits on new canes till killed by frost.
8	---	---	---	*	---	One of the best of Yellow caps.
9	*	*	*	*	*	Canes have but few spines. Very productive.
10	*	*	*	*	*	Larger than McCormick. Is now the leading Black Cap.
11	---	---	---	†	---	Nearly as large as Gregg; better in flavor, and clear black in color.
12	---	---	---	*	---	A very popular sort.
13	*	*	*	*	*	Very seedy. For this reason profitable for drying.
14	*	*	*	**	*	Plant very vigorous with stout thorns. Very productive. Profitable.
15	*	*	*	*	*	The most juicy and luscious of the Black Caps. Prized by some in Berrien county for market.

SECTION XVI.—RASPBERRIES—CONTINUED—*RUBUS OCCIDENTALIS* AND SUPPOSED
HYBRIDS; ROOTING FROM THE TIPS OF THE BRANCHES.

Number.	Names.	Descriptions.						Use and value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Season.	Origin.	Dessert.	Cooking.	Market.
16	Muskingum	l	r	p r	v g	July.	Ohio.	8	---	---
17	Nemaha.....	l	r ob	b	g	m July.	Neb.	5	5	10
18	New Rochelle	l	r c	p	v g	m July.	N. Y.	8	8	6
19	Ontario.....	m	r	b	v g	July.	N. Y.	6	6	8
20	Ohio	l	r	b	g	m e July.	Ohio.	8	9	9
21	Palmer	m	r	b	v g	July.	Ohio.	8	---	---
22	Shaffer	l	r	p r	v g	m e July.	N. Y.	8	9	8
23	Souhegan.....	m	r	b	g	b m July.	N. H.	8	9	9
24	Tyler	m	r	b	g	b m July.	N. Y.	8	9	9

SECTION XVII.—RASPBERRIES—*RUBUS IDÆUS* AND *STRIGOSUS*, INCREASING BY
SUCKERS OR SPROUTS.

ABBREVIATIONS FOR THIS SECTION.

Form. Color.
c. conical. ob. obtuse. r. roundish. b. bright. c. crimson. o. orange.

Number.	Names.	Descriptions.						Use and value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Season.	Origin.	Dessert.	Cooking.	Market.
1	Brandywine, <i>Susqueco</i>	m	r ob c	b r	v g	July.	Am.	8	9	9
2	Clarke		c	b c	v g	e July.	Conn.	8	8	7
3	Cuthbert, <i>Queen of the Market</i>	l	r c	b c	b	July.	N. Y.	8	8	10
4	Franconia	l	ob c	p r	v g	July.	Eur.	8	8	7
5	Golden Queen	l	r c	o	b	July.	N. J.	8	8	10
6	Hansell.....	s	r	r	g	b July.	N. J.	7	7	7
7	Herstine.....	l	r ob c	b s	v g	July.	Penn.	10	10	8
8	Marlboro	l	r	r	g	July.	N. Y.	7	7	9
9	Orange	l	c	o	b	July.	Penn.	10	10	4
10	Philadelphia	m	r	p r	g	July.	Penn.	6	8	8
11	Reder	l	r	b r	v g	m July.	Mich.	9	9	9
12	Reliance.....	m	r	b r	g	e July.	N. Y.	9	9	8
13	Superb	v l	r ob	p r	v g	b July.	N. J.	9	9	7
14	Turner.....	m	r	b r	v g	July.	Am.	9	8	9

SECTION XVI.—RASPBERRIES—CONTINUED—*RUBUS OCCIDENTALIS* AND SUPPOSED
HYBRIDS; ROOTING FROM THE TIPS OF THE BRANCHES.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern Lake Shore.	Northern Lake Shore.	
16	---	---	---	*	---	Apparently an improvement upon Shaffer.
17	*	*	*	*	*	Much like Gregg, and claimed to be hardier.
18	---	---	---	*	---	Excellent; but too dull in color.
19	---	---	---	*	---	Fruit with a thick bluish bloom. Not very acid. Very firm.
20	*	*	*	*	*	A very profitable market variety; good for drying.
21	*	*	*	*	*	New, promising, not yet fully proved.
22	*	**	*	*	*	Enormous grower. Fruits ripen in succession. Superior for canning.
23	*	*	*	*	*	A good, early, market blackcap.
24	*	*	*	*	*	Very much like Souhegan.

SECTION XVII.—RASPBERRIES—*RUBUS IDEUS* AND *STRIGOSUS*, INCREASING BY
SUCKERS OR SPROUTS.

ABBREVIATIONS FOR THIS SECTIONS.

Color.

p. purplish.

r. red.

s. scarlet.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern Lake Shore.	Northern Lake Shore.	
1	*	*	*	*	*	Its beauty, size, color and firmness are strongly in its favor.
2	*	*	*	*	*	Best early red, but does not set well. Not fully hardy away from lake protection. Unproductive on southern lake shore
3	*	**	*	**	*	Very firm, productive and hardy. Has come to be the leading market variety of its class.
4	*	*	*	*	*	Like nearly all foreign sorts, away from lake influence must have winter protection.
5	*	*	*	*	*	Like Cuthbert, except in the color of the fruit.
6	*	*	*	*	*	Hardy. Lacks vigor and productiveness.
7	*	*	*	**	*	May not be fully hardy in the interior of the State. Lacks firmness. Valuable where it will stand; especially for home use.
8	*	*	*	*	*	Very vigorous and productive. Is being extensively planted.
9	*	*	*	*	*	Must have winter protection. Unequaled for amateur purposes; but very tender.
10	**	**	*	**	*	Entirely hardy; dull color; lacks quality and size. Suckers but little. A bad shipper. Nearly abandoned.
11	---	*	*	*	---	Highly esteemed where fully tested. Canes not always healthy.
12	---	---	---	*	---	Berries good, even size. Profitable, but its color is too dark.
13	*	*	*	*	*	A good family berry. Crumbles easily.
14	*	*	*	**	*	Strong grower; hardy; productive. Suckers profusely. Lacks firmness. Leading market variety in Berrien county.

SECTION XVIII.—STRAWBERRIES.

ABBREVIATIONS FOR THIS SECTION.

Form.

Color.

c. conical.
co. cocombed.
l. long.
n. necked.

o. oblong.
ob. obtuse.
ov. oval or ovate.
r. roundish.

b. bright.
c. crimson.
d. dark.

p. pale.
r. red.
s. scarlet.

Number.	Names.	Descriptions.								Use and value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Sex.	Texture.	Season.	Origin.	Dessert.	Cooking.	Market.
1	Alpha.....	m	ov c	r	g	b	m	9 June	Ont.	8	9	9
2	Arnold's pride.....	v l	c co	c	v g	b	f	24 "	Ont.	8	9	10
3	Atlantic.....	l	l c	bs	v g	b	m	20 "	N. J.	8	---	8
4	Beder Wood.....	l	r c	c	g	b	m	15 "	Ill.	5	---	10
5	Belmont.....	v l	l r c	b c	b	b	f	20 "	Mass.	10	---	7
6	Bidwell.....	v l	l c n	bs	v g	b	f	12 "	Mich.	9	8	9
7	Black Defiance.....	v l	r ob c	d c	b	b	f	10 "	N. J.	9	---	8
8	Boyden, <i>Seth Boyden</i>	l	ob c	b c	v g	b	f	13 "	N. J.	9	---	8
9	Bright Ida.....	v l	c r	br	v g	b	m	19 "	Ont.	8	8	10
10	Bubach, No. 5.....	v l	ob r c	b c	v g	p	m	20 "	Ill.	8	---	10
11	Captain Jack.....	m	r c	b c	v g	b	f	10 "	Mo.	8	---	8
12	Champion.....	l	r c	d c	v g	p	f	10 "	N. Y.	7	---	9
13	Charles Downing.....	l	r c	ds	v g	b	m	10 "	Ken.	8	8	10
14	Cheney.....	l	r c co	b c	v g	p	m	10 "	N. Y.	9	---	8
15	Cowing.....	v l	r ob c	b c	v g	b	m	12 July	Ind.	10	8	9
16	Crescent.....	l	c	ds	g	b obs	s	12 June	Conn.	6	4	10
17	Crimson Cluster.....	l	o c	b c	v g	p	m	12 "	N. J.	8	---	---
18	Cumberland.....	v l	r ob c	b c	v g	b	m	12 "	Penn.	9	8	9
19	Downer.....	m	r c	bs	v g	b	f	10 "	Ky	7	---	8
20	Duncan.....	l	c	dr	v g	b	f	5 "	N. Y.	9	---	5
21	Early Canada.....	m s	r c	d c	v g	b	m	16 "	Ont.	9	7	8
22	Enhance.....	l	c co	dr	g	b	f	12 "	Ohio	5	---	10
23	Eureka.....	v l	o c	b c	v g	p	m	17 "	Ohio.	8	---	8
24	Gandy.....	v l	ob c	b c	v g	b	m	19 "	N. J.	9	---	9
25	Gem (Nehring).....	v l	c	br	g	p	f	17 "	Ill.	6	---	9
26	Glendale.....	v l	l c	bs	g	b	f	16 "	Ohio.	7	8	7
27	Haverland.....	l	o c	b c	v g	p	f	11 "	Ohio.	9	---	9
28	Henderson.....	l	l c	c	b	b	m	15 "	N. J.	10	1	1
29	Jersey Queen.....	m	ob c	c	g	p	m	15 "	N. J.	7	---	8
30	Jessie.....	v l	ob c	b c	v g	b	f	17 "	Wisc.	9	---	10
31	Indiana.....	m	r c	c	g	b	m	18 "	Ind.	7	---	8

SECTION XVIII.—STRAWBERRIES.

ABBREVIATIONS FOR THIS SECTION.

Sex of blossoms.

Texture.

Season.

b. bi-sexual or perfect.
p. pistillate.f. firm.
m. medium.
s. soft.

The date (in June) of the ripening of the first perfect specimen is given in each case as the most convenient mode of indicating the relative season.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern Lake Shore.	Northern Lake Shore.	
1	*	*	*	*	*	Hybrid of the late Chas. Arnold. One the most productive early sorts.
2	*	*	*	*	*	Hybrid of the late Chas. Arnold. A superior market berry.
3	---	---	---	*	---	Productive. A market variety.
4	---	---	---	*	---	Plant healthy and vigorous—Market.
5	†	†	†	*	†	Superior dessert fruit. May prove profitable for market.
6	*	*	*	*	*	Does not always ripen well at the tip. Valuable.
7	*	*	*	*	*	Very perfect in form. Moderate bearer. Holds its size well. Excellent.
8	*	*	*	*	*	To produce with certainty should be grown in hills, and on moist soils.
9	*	*	*	*	*	Hybrid of the late Chas. Arnold. A market variety.
10	*	*	*	*	*	One of the best new varieties for market.
11	*	**	*	*	*	Exceedingly productive. Even sized, but not quite large enough or good enough.
12	*	*	*	*	*	Might properly take a leading position as a market sort. Windsor Chief is identical.
13	**	**	*	*	**	Succeeds generally as a fruit for near marketing. Plant vigorous.
14	*	*	*	*	*	Needs a little more firmness for remote markets. Plant a weak grower.
15	*	*	*	*	*	One of the very finest large berries. Succeeds on very light soil. On heavy soils often misshapen.
16	*	**	*	**	*	Vigorous plant. Very prolific, but lacks quality and firmness. Foliage healthy.
17	---	---	---	†	---	Must have high culture; otherwise fails.
18	*	*	*	*	*	Excellent as a berry for home use, or for near marketing.
19	*	*	*	*	*	Valuable for near market. Plant vigorous. Nearly abandoned.
20	*	*	*	*	*	A highly desirable amateur berry. Plant vigorous. The first to ripen. Will do for early market.
21	---	---	---	*	---	Productive and early. Not generally valued.
22	---	---	---	*	---	One of the largest and most productive.
23	---	---	---	†	---	Bears profusely. Promising as a market berry.
24	---	---	*	*	---	Desirable late market berry. Good dessert fruit.
25	---	---	---	*	---	Plant exceedingly vigorous and productive. Fruit very large and showy.
26	*	*	*	*	*	A late sort. Valued for market.
27	---	---	---	†	---	Plant vigorous. Promises to be valuable.
28	---	*	---	*	---	Of high quality. Plant lacks vigor.
29	*	*	*	*	*	Variable. Generally productive.
30	*	*	*	*	*	Is very highly praised, so far as tested.
31	*	*	*	*	*	Has valuable characteristics for market.

SECTION XVIII.—STRAWBERRIES—CONTINUED.

Number.	Names.	Descriptions.								Use and Value. Scale 1 to 10.		
		Size.	Form.	Color.	Quality.	Sex.	Texture.	Season.	Origin.	Dessert.	Cooking.	Market.
32	Jewell	l	r o b c	b c	g	p	f	26 June.	Conn.	7	9	10
33	Jucunda	v l	o b c	b s	g	b	f	14 "	Am.?	6	---	9
34	Kentucky	l	l r c	b s	v g	b	f	16 "	Ky.	8	---	8
35	Maggie	m	o v r	s	g	b	s	30 "	Ont.	8	7	8
36	Manchester	l	c r	c	g	p	f	26 "	N. J.	8	9	9
37	May King	m	o b c	b c	v g	b	m	10 "	Am.	8	---	8
38	Miami	l	---	---	---	p b	---	15 "	---	---	---	9
39	Miner	l	r c	c	g	b	s	14 "	N. J.	8	8	8
40	Mount Vernon	l	c r	b s	g	b	m	24 "	---	7	8	9
41	Mrs. Cleveland	l	---	b c	---	p	---	15 "	Ohio.	6	---	9
42	New Dominion	l	o b c	b r	g	b	m	14 "	Ont.	8	8	8
43	Ohio	l	l c	c	g	p	m	19 "	Ohio.	8	---	8
44	Ontario	v l	o b c	b c	v g	b	m	14 "	N. Y.	8	---	9
45	Parker Earle	m l	l c	c	v g	b	f	15 "	Texas.	8	---	10
46	Parry	v l	r o b c	s	b	b	f	26 "	N. J.	10	---	---
47	Pearl	m	o c	c	b	b	m	16 "	N. J.	9	---	---
48	Phelps, <i>Old Ironclad</i>	m	o b c	b c	v g	b	m	15 "	---	7	---	8
49	Piper	m	r	b c	g	b	f	24 "	Ill.	8	8	9
50	Saunders	l	c	c	v g	b	f	12 "	Ont.	7	---	9
51	Seneca Queen	l	r c	b c	b	b	m	11 "	N. Y.	8	---	8
52	Sharpless	v l	o c c o	b r	v g	b	m	14 "	Penn.	8	---	9
53	Sucker State	m	---	---	---	---	---	---	Ill.	---	---	---
54	Summit	l	r o b c	d s	v g	p	f	27 "	Ohio.	6	---	9
55	Triomphe (de Gande)	l	r o b c	b r	b	b	f	12 "	Bel.	10	---	9
56	Vick	m	r c	c	v g	b	f	17 "	Mo.	6	---	7
57	Warfield No. 2	m	c	d r	v g	p	f	12 "	Ill.	9	---	10
58	Wilson	l	r c	d c	g	b	f	11 "	N. Y.	6	9	9
59	Woodruff	m	l c	d c	v g	b	f	13 "	Mich.	7	---	8

SECTION XVIII.—STRAWBERRIES.—CONTINUED.

Number.	Locality.					Remarks.
	East.	Center.	South.	Southern Lake shore.	Northern Lake shore.	
32	---	---	---	†	---	Decidedly the most productive of the introductions of 1855. Makes very few runners.
33	*	*	*	*	*	Vigorous. Profitable when grown in hills and on strong soils. At the north this succeeds on sandy soils.
34	*	**	*	**	*	Vigorous. A good late market berry. Nearly superseded.
35	*	*	*	*	*	Hybrid of the late Chas. Arnold. Very productive. Deficient in color.
36	---	*	---	*	---	Has become a leading market berry.
37	*	*	*	*	*	Very popular as an early berry.
38	---	---	---	*	---	A new, promising, productive market variety.
39	*	*	*	*	*	Vigorous and productive. Excellent for near market.
40	*	**	*	*	*	Very highly praised as a market variety. Quite late.
41	---	*	*	*	---	An Ohio seedling of fine promise.
42	---	*	---	*	---	Bright colored, large, productive.
43	---	---	---	†	---	Promising for late market.
44	---	---	---	*	---	Much like Sharpless, but preferable to that variety.
45	*	*	*	*	*	Of good size and quality. Hardy. Very productive. Valuable.
46	---	---	---	*	---	Very beautiful, fine flavor. Large. Productive.
47	---	---	---	†	---	A promising fruit, of high quality.
48	*	*	*	*	*	Generally prized as a market variety.
49	*	*	*	*	*	Has valuable qualities as a market fruit.
50	*	*	*	*	*	A promising market variety, originated by John Little of Ontario.
51	*	*	*	*	*	Continues large to the last. A fine market berry. Very desirable.
52	*	*	*	*	*	Is attracting much attention. Lacks firmness for distant marketing. Does best in hills.
53	---	*	*	*	---	Valued in Illinois as a market variety.
54	---	*	*	*	---	Fine large even sized fruit. Not a strong grower.
55	*	*	*	*	*	Flavor rich, excellent. Must be grown in hills to warrant success for market.
56	*	*	*	*	*	In plant and fruit much like Captain Jack.
57	---	---	---	†	---	A vigorous plant. Very productive.
58	**	**	**	**	**	Colors early. Only good when fully ripe. Later pickings fail in size. The leading market berry with the mass of growers.
59	*	*	*	*	*	Ripens fully at the tips. Valuable.

REJECTED LIST.

With the purpose to avoid the liability to the reintroduction of varieties of fruit which have been already tried and abandoned, we append lists of such as have heretofore appeared in the catalogue, but which, for one cause or another, have been superseded, and have therefore been dropped from the lists.

At the first revision, in 1879, the following were omitted:

Apples.	Pears.	Plums.
Autumn Pearmain. Bush. Lancaster Greening.	Dunmore. Jalousie de Fontenay-Vendee.	Admiral.

The following were dropped at the second revision, in 1881:

Apples.	Blackberries.	Peaches.
Woolcot (Steere) the same being continued under the corrected name—Morris' Red.	White Seedling.	Windoes.
	Plums.	Strawberries.
	Dorr's Favorite; this proving to be a synonym for Pond, <i>Font-hill</i> .	Windsor Chief, which is identical with Champion.

In the third revision, in 1883, the following were omitted:

Apples.	Peaches.	Strawberries (continued).
Better than Good. Hall.	Cooper's Mammoth.	Grace. Hudson No. 10. Ida. Iowa Prolific. Kissany. Large Early Scarlet. Lennig's White. Longworth's Prolific. Luckhurst. Major McMahon. Napoleon III. President Lincoln. President Wilder. Romeyn. Scarlet Globe. Seedling Eliza. Star of the West. Starr. Sterling. Walden. Wilding Seedling.
Black Cap.	Strawberries.	
Lum's Everbearing.	Afrique. America. Burr Oak. Caroline. Centennial Favorite. Cinderella. Crimson Cone. Damask Beauty. Dr. Warder. Early Hudson. Emperor. Essex Beauty. Fillmore. Fowler's Seedling. French. Frontenac. General Sherman.	
Red Raspberry.		
Early Andrews. Saunders. Winant.		
Cherries.		
Rivers' Amber.		

REJECTED LIST—CONTINUED.

The following were omitted in the fourth revision, in 1885:

Cherries.	Red Raspberries.	Strawberries (continued.)
Duchesse de Palluau. Rumsey's Late Morello.	Naomi—A probable synonym of Fastolf.	Marvin. Matilda. Metcalf. Michigan. Minnesota. Russell. Seneca Chief. Springdale.
Grapes.	Strawberries.	
Taylor's Bullitt.	Boston Pine. Burgess. Excelsior. Forest Rose. Golden Defiance. Hooker. Kirkwood.	
Cap Raspberries.		
Ganargua.		

In the revision for 1888, being the fifth, the following are omitted.

Apples.	Cherries.	Grapes.
Craig's August. Early Long Stem. Fort Miami. Gabriel, <i>Ladies' Blush</i> . Green's Choice. Housum's Red. Lacker. Melt in the Mouth. Newark Pippin. Northern Sweet. Progress. Pumpkin Russet. River. Somerset (N. Y.) Summer Bellflower (N. Y.) Summer Greening. Sweet Baldwin. Table (greening). Twin. Wealthy's Favorite.	Buttner's Yellow. China Bigarreau. Early Amber. Large White Bigarreau. <i>Bigarreau Gros Coeuret</i> . Merveille de Septembre. Red Heart. Tradescant. Transparent Guigne. White French. White Tartarian. Wilkinson.	Allen. Alvey. Anna. Belvidere. Black Hawk. Cornucopia, <i>Arnold's 2</i> . Croton. Mottled. Neff, <i>Keuka</i> . Norton's Virginia. Othello, <i>Arnold's 1</i> . Peter Wylie. Rebecca. Rogers' 20. Senasqua. To Kalon. Union Village. York Madeira.
Crabs.	Cap or Tip Rooting Raspberries.	Strawberries.
Brier's Sweet.	Canada. Davison's Thornless. Ellisdale. Norwood. Purple Cane. Seneca. Wetherbee.	Agriculturist. Burr's New Pine. Duchess. Great American. Green Prolific. Hervey Davis. Hovey. Monarch of the West. New Jersey Scarlet. Photo, <i>Martha</i> . Pioneer. Victoria, <i>Golden Queen</i> .
Peaches.	Raspberries Increasing by Suckers.	
Muscogee. Thurber.	Arnold's Red. Bristol. Delaware. Fastolf, <i>Naomi</i> ? Highland Hardy. Hornet. Kirtland. Montclair. Red Antwerp. Thwack.	

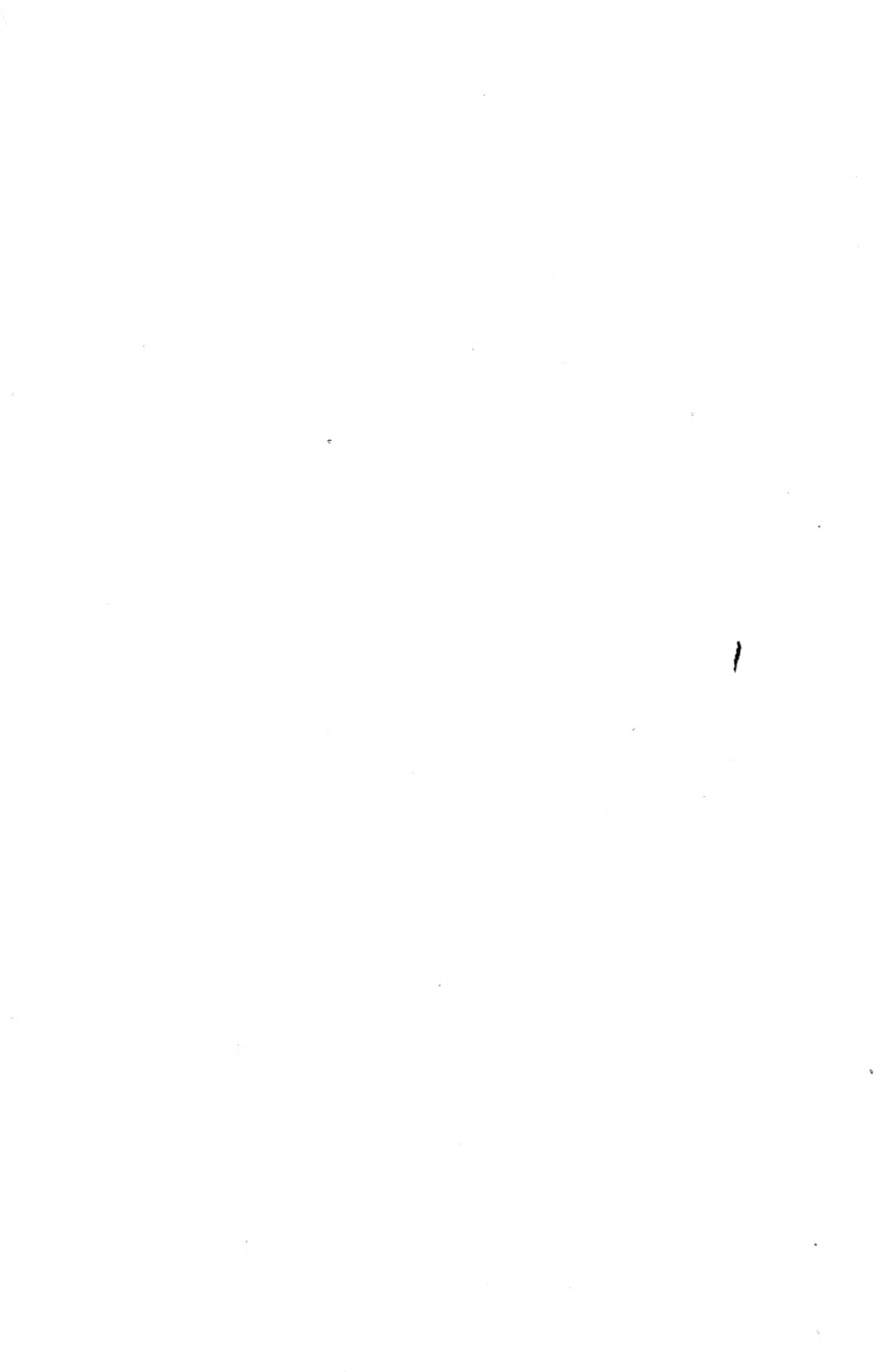
REJECTED LIST—CONTINUED.

In the revision for 1890 the following have been omitted:

Apples.	Blackberries.	Strawberries.
Aunt Hannah. Bars. Chronical. Daniel. Evening Party. Harvest Redstreak. Spiced Sweet. Sweet and sour. Western Spy. White Juneating, <i>Early May</i> .	Brunton.	Cornelia. Daniel Boone. Gipsy. Goldsmith. Longfellow. Nicanor. Russel's Advance. Shirts. Warren.
	Pears.	
	Goubalt.	

REPORTS OF LOCAL SOCIETIES

IN MICHIGAN.



REPORTS OF LOCAL SOCIETIES.

ALLEGAN COUNTY SOCIETY.

Reported by G. H. LAFLEUR, Secretary.

The August meeting was held at the home of ANDREW BRACELIN in the town of Watson on the 19th. The forenoon was spent in looking over the farm and especially the fine Jersey cattle of which Mr. BRACELIN is the owner. Dinner was announced promptly at noon in order to give all the time possible for the afternoon discussion.

On coming together it was found there were present quite a number of prominent and successful grape-growers, including Dr. TURNER and A. C. NEWMAN of Wayland. The subject of grape-culture was first considered, and was opened by Dr. TURNER. He said there are several vineyards in the town of Wayland and so far as he had observed they promised a large yield.

A. J. BRACELIN: Has the Niagara grape proved to be what has been claimed for it?

Dr. TURNER: I think the Niagara grape is meeting the expectations of planters, and so far we have no reason to feel disappointed.

A. J. BRACELIN: Is the Worden a better grape than the Concord?

M. T. SMITH: It is a week earlier and of better quality.

A. C. NEWMAN: My vines are loaded with fruit. The rose-bugs have done some damage in my section. Should like information as to the best method of destroying them. They work more on sand than on clay.

M. T. SMITH: Take a pan partly filled with water; shake them from the vine into the pan. This is easily done and is effectual.

A. J. BRACELIN: I understand that grapes can be grown in most of the states. Is there not danger of overstocking the market? Have we any reasonable assurance that the price for grapes in the future will warrant planting extensively?

G. H. LAFLEUR: There are but few things connected with fruitgrowing that we can be really certain of. We draw conclusions from the condition of surrounding things. The result of certain efforts in the past may reasonably be expected in the future if surrounding conditions are not greatly changed. While the amount of grapes grown has increased rapidly during the past two years, the prospect is that such increase will continue more rapidly in the future. The demand has kept pace with the production, and yet comparatively a small part of the people have learned that the grape is one of the cheapest and most healthful fruits grown. The people are coming to this knowledge and the demand will undoubtedly keep pace with the supply. There are some very excellent grapes grown and sold in

market. This is cultivating a taste for a higher standard as to quality. Too many grapes, unripe and poor in quality, placed on the market in the beginning of the season, hurts the sale of better fruit. Dealers should refuse to handle such fruit. Very few people will eat sour grapes while almost every one is fond of ripe sweet ones.

Dr. TURNER: There is more profit in grapes at two cents per pound than in wheat at one dollar per bushel.

M. T. SMITH: For the past ten years my grapes have netted me four cents per pound on an average. The lowest amount received for one acre during the past ten years was one hundred dollars, and the highest amount four hundred dollars. I set my vines ten feet each way and train on stakes. This method allows of cultivation both ways. I can pass through the vineyard in any direction, which can not be done when the vines are trained on trellises. By my method it costs no more to cultivate an acre of grapes than it does to tend an acre of corn.

In answer to the question, "What did grapes sell for in the market last year?" A. C. NEWMAN said: I sold my grapes last year for six cents per pound. Sold some for seven cents per pound. A. J. WARNER sold his Concord last year in Allegan for five cents.

M. T. SMITH: The vines should be cut back and properly pruned for the next year's crop in the fall or early winter. Then no further pruning will be necessary until the fruit is set for the crop. This obviates the necessity for pruning in the spring at time of bleeding.

A. C. NEWMAN pruned when the sap flowed freely and at other times. Could see no difference in fruit or vine.

A. J. BRACELIN: What per cent. of the men who set vineyards make a success?

A. J. WARNER: Perhaps ten per cent. of the men planting vineyards make a success. While a few others have been moderately successful, a large per cent. make a failure of the business.

M. T. SMITH: Some men can grow grapes but have no faculty for selling. In the hands of the right men grapes are a paying crop.

G. H. LAFLEUR: I think the answer given to Mr. BRACELIN's question indicates that about one in ten succeeds, while nine fail. So if you are the tenth man you need have but little fear from the other nine.

A. C. NEWMAN: I have recently talked with two commission men from Minneapolis who said: "Send all the good, ripe grapes you have to that city. The people of the northwest want such fruit and will pay fair prices." Good fruit reaching Minneapolis always sells for good prices. The most of the losses and low prices come from placing unripe, badly packed, or too much low-grade fruit on the market. Such fruit scarcely pays for packing, freight, and commission.

Mr. NEWMAN had found by pruning that he could get the same number of pounds in a less number of clusters; more compact and uniform in size. Such grapes brought the highest price in market. Allowing three tons to the acre at three cents per pound, grapes paid better than farm crops.

J. M. GRANGER had sprayed his apple orchard for three years. Less apples dropped off and a much larger per cent. was perfect as the result.

A. J. BRACELIN: I think the time is near at hand when all orchards will be sprayed if we expect to escape the codlin moth.

THE SEPTEMBER MEETING.

The society gathered at the home of A. J. WARNER of Monterey. By ten o'clock nearly all had arrived; and this was the season for ripe grapes and Mr. WARNER has a fine vineyard—situated on an elevation overlooking the surrounding country for miles, southern exposure, exempt from early and late frosts; a better site for a grapery could not be found in the county. If any one had entertained doubts as to the members of this society being partial to grapes, that doubt vanished—as well as did a large amount of well-ripened Concords.

Dinner was announced early, but it was after one o'clock before the third table had finished and were ready for business. President PEET called to order and invited Mr. WARNER to open the meeting with a few remarks upon the object of such meetings. This he did, and Mrs. WILTS H. WILLIAMS read a poem. Dr. H. J. TURNER of Wayland read the following paper:

The subject that was assigned me at your last meeting, "The relation of fruit to health," I consented to write a paper about to be read at this meeting, little thinking of the magnitude of the undertaking and the time and thought it would require to prepare it, or I might have declined; but, in order that the people may have a few ideas or hints presented at this time, for their future reflection and consideration, I have put together these few thoughts. Should I succeed in impressing the fact that fruits have a wonderful tendency to prolong life, I will have done as much as I expected.

When we take into consideration the length of time fruits have been grown, I wonder if much more can be said to advance or stimulate their use; for some fruits have been cultivated from the earliest historic ages. To say nothing of the garden of Eden and the vineyard which Noah planted after the deluge, we find in the book of Moses evidence that the cultivation of fruits was much practiced in Egypt before the time of the exodus of the Israelites; and among the Babylonians, the Persians, the Chinese, and the inhabitants of India, it can be traced back to the most remote antiquity. The grape, the fig, the melon, and the pomegranate are among the first fruits of which we find any particular notice in history, and their uses are more general today than then.

During the season of fresh fruits, they should always form a part, and a major part, of the morning meal. If there were any hygienic reason for the custom of eating fruit at the end rather than at the beginning of the meal, we think that the custom would not be so general as it is. Man is a contrary animal (and in that I include women—that is, some women) especially in that which concerns health, and if the rules of hygiene dictated fruit or anything else as a *first* dish, in all human probability it would be the dish with which he would wind up. This we consider one argument, a negative one it is true, to prove that health would be better served with fruit at the beginning than the end of the meal; but there is another and a stronger one. The season of fruits is also the season when the system requires fruit—indeed, it is better without the grosser foods it can take at other times of the year with advantage. If it be admitted, then, that the less of these unrequired foods a man takes the better, it follows that they should come at the end of the repast, if they come at all, because then they would not be so likely to be craved, and consequently less of them would be eaten. But whether eaten at the beginning or the end of the meal, fresh, ripe fruit—when it can be had—is a blessing

the table should never be without. Cheaper and far healthier than the many things that too often crowd it out, let it come at the end of the meal, if custom or fashion will have it so, for it is infinitely better than than not at all. It is curious, but true, that the table of the day laborer in town, who does not own a foot of land and who, the country man contemptuously declares, "lives from hand to mouth," is more bountifully supplied with vegetables and fruits than that of the farmer in the midst of his broad acres. The latter gives a variety of excuses for his neglect; and while visiting at a neighbor's, one day, with his mouth full of his second help of delicious green peas, will declare a garden "don't pay"—and, as he backs up his plate for another quarter section of strawberry shortcake, will wonder how his host can find time to "putter with small fruits," regardless of, or indifferent to, the fact that *no* acre on his farm will yield him so much of good living, and do so much to promote his health and happiness, as a quarter acre garden spot intelligently tended.

Even so small an area has infinite possibilities to be developed into rich reward when we are, as the politician says, "educated up" to the right standard which leads us to seek less to hoard money for a possible "rainy day" than to enjoy life's privileges and pleasures every day.

Undoubtedly the garden or fruit patch for the busy farmer, with both eyes fixed upon the bald-headed bird of liberty as represented on our silver dollar, who counts that day lost which does not advance his worldly interests, is what may more properly be called the "truck patch," where horse and cultivator give the culture and where the scriptural injunction, to let the tares grow with the wheat until the harvest, is literally obeyed; but this is better than no garden at all.

There is a moral side to this question. Man in general dislikes work, and his greatest effort is toward means to avoid it. Anything which tempts us to labor is therefore of value. More than half of the labor of the world is expended to please the eye. The back-woodsman must have his ax painted red, and the needles of the half-starved seamstress must be wrapped in gilded paper, and I speak in reverence in saying that more than half the work of the Creator is the giving his objects beauty of form and color. God loves beauty and so should we. He has given us capacity for enjoying beautiful objects, and it is our duty to develop and minister to that capacity; and anything that tends to make us healthy and interesting to our friends should be made of special study. Surely there is nothing more healthgiving than growing, caring for, and eating plentifully of good, fresh ripe fruit.

The term fruit, in its proper signification, includes the fruits of the endogenous as well as the exogenous plants; but it is of the latter that I make reference specially, with some general statements common to all.

While some fruits are of the highest value as articles of food, others are regarded as articles of luxury. The bountiful supply of succulent fruits in tropical climates is a bountiful natural provision for the supply of real wants, contributing much to the health and comfort of the inhabitants. The coolness of the succulent fruits (as well as the cooling properties of their acids) renders them peculiarly grateful during the hot season, their temperature being, when freshly gathered, considerably below that of the surrounding atmosphere; but besides their cooling qualities, the fruits are a food to man and beast and possess also certain medicinal and other peculiar qualities extremely beneficial to man. However, the albuminous matters are present in fruits in so small quantities that their use as tissue-

forming food is of very little consequence. Thus, to obtain an amount of albumen equivalent to the contents of one egg, we must eat more than a pound of cherries, nearly a pound and a half of grapes, two pounds of strawberries, more than two and a half pounds of apples, or four pounds of pears.

Fresenius calculates that one pound of starch (which is equivalent to about 5.5 pounds of potatoes) may be replaced by 5.4 pounds of grapes, 6.7 pounds of cherries or apples, 10.8 pounds of currants, or 12.3 pounds of strawberries. The uses of fruits are, therefore, not so much for their material nourishment as for their vegetable salts (which are of great therapeutic utility) and for their agreeable flavor. The different berries contain as a general rule, a larger proportion of free acids than stone fruits or apples or pears; and their acidity is the more demonstrated to the taste from their containing relatively small quantities of gum and pectium. In gooseberries we notice an agreeable proportion between the sugar and the acids, the ratio being as six to one in the sweeter kinds and four to one in the less sweet varieties. Currants are so exceedingly acid to the taste that they are almost always eaten with sugar, the ratio of sugar to the acid being about three to one. It is the aroma of the strawberry that we chiefly prize. The ratio of the sugar to the acids varies in different varieties and in difference of season from two to one to seven to one. The same is also true of raspberries. Grapes exceed all other fruits in the amount of sugar, the ratio being seldom less than twelve, and sometimes reaching twenty-six per cent. There has been enough said upon these fruits to suggest much as to other fruits, which an active mind will observe.

Fruits directly aid in maintaining the essential equilibrium of heat in the system. The malic acid of apples and kindred fruits, the tartaric acid of grapes and berries, the citric acid of lemons, etc., consists largely of oxygen, the element to combustion, so that when eaten in sufficient quantity these fruits serve as the heat-producing element. Also, by the fluids which they supply, they aid in carrying off, through the lungs, skin, and kidneys, the waste of the system; a matter no less essential to life than food itself. This water, of which fruit is largely composed, holds in solution many of the organic salts of potash, soda, lime, etc., thus supplying to the system the alkalies which, in the form they are afforded in fruits, constitute a specific to scorbutic tendency. The malic or tartaric acids afford also a needed laxative to persons predisposed to constipation, while at the same time, as found in some fruits, they act as an astringent to check any undue degree of looseness.

But many fruits are highly nutritious, owing to the supply of gluten they contain, and the readiness with which they are reduced to a pulp renders them easy of digestion. This pulpy condition and consequent ease of digestion is increased in some kinds of fruit, as the apple, by roasting, since by this process the cells in which the acids are imprisoned become broken, and this rupturing occasions a more perfect mingling of the sugar and acids, rendering the texture more pleasing to the palate and acceptable to the sensitive stomach. It has been said that "fruit is golden in the morning, silver at noon, and lead at night," yet there is so much diversity in organs of digestion that I doubt if a rule like this can be universal. However, for my own part, I enjoy good ripe fruit at any time and can attribute no ill effects to eating it with ordinary discretion.

More might be said on this very important subject, but I fear I have

taxed your patience quite long enough, so will thank you for your attention and indulgence in listening to so lengthy an article.

This was followed by a paper upon the apple, read by the secretary, most of which has already appeared in this volume, at the close of which A. J. BRACELIN enquired if anyone had so carefully pruned his apple orchard, while young, that only a large pruning knife was required to do the work, as stated in the paper.

MR. LAFLEUR: Although the statement may not be entirely practical, nor literally true, yet it is true and practical for the first six years, and is thrown in to illustrate the importance of attending to these things while the trees are young. Use the knife as long as you can; but when necessary, use the saw, remembering always to use good, practical common-sense.

CHARLES MANWARING: To be able to form perfect tops, one should understand the habits of the different varieties and prune accordingly. We should aim to assist nature to carry out her design in forming perfect tops to trees.

J. H. WETMORE: When I set my apple orchard I made some mistakes, first, in not securing the right varieties; next, in planting too near together, 33 feet apart (I should not now set less than 40 feet); next, I formed the heads too low and cut out some of the leaders to form open, spreading tops. I should now head the trees higher, especially the Greening, and never cut out the main leaders but let them grow more as nature indicated. The Greening, on my soil, has been one of the most profitable varieties. I would now set Baldwin, Stark, Greening, and Hubbardston.

CHARLES MANWARING: Although Mr. WETMORE's trees were headed too low at the start, they were improved soon after by good pruning and the lower limbs cut away, so that now, taking the orchard altogether, it would be hard to find one with better formed tops.

W. J. SHIRLEY: Is the Ben Davis tree profitable, or is it advisable to see that variety for market, on sandy soil? I have seen it bearing while young, large crops of fine-looking fruit which sells readily in market. The tree is very hardy. The quality is not the best in the fore part of winter, but in May and June they are at their best.

A. J. BRACELIN: I would not set Ben Davis, and would not advise others to set that variety. Its advocates claim that the tree is hardy, commences to bear young, and sells well in market. This may all be true, but the quality is poor and in time will be condemned. The paper just read claimed that the public taste is being educated up to a higher standard in quality. I think giving the public Ben Davis apples to eat would be educating the public taste in the wrong direction. There are plenty of good apples which can be grown in this section. Why not grow good fruit when we can?

MR. LAFLEUR: There has been more discussion over the merits of the Ben Davis apple than any other grown here. I think the whole thing may be summed up like this: Tree a good grower, hardy and prolific; are early bearers; fruit attractive in color; good size; a long keeper, improving in quality with age; sells well in market at present; it may continue to sell readily for many years, or it may not. We know what it is doing at present; we can only speculate as to its future.

A. J. BRACELIN: Is the Steele's Red apple a distinct variety? I have heard this disputed.

J. H. WETMORE: I have what is called Steele's Red. It is different from the Baldwin or Red Canada.

J. M. GRANGER: Will Mr. LAFLEUR give his opinion?

MR. LAFLEUR: The Red Canada has been called Steele's Red improperly; it is only a synonym. The Baldwin at one time was called Steele's Red, sometimes, by nurserymen; this too is incorrect. The name should never be applied to either the Red Canada or the Baldwin. There is no distinct variety known as Steele's Red, except some local name applied to some variety, the true name of which is unknown. This misleads and confuses. If we do not know the correct name of an apple we should find out what it is before giving a local name.

J. M. GRANGER was next called out, and he began by saying his theory of starting an apple orchard was radically different from those marked out by MESSRS. LAFLEUR and WETMORE, and he thought would be much more profitable, with but a trifling increase in outlay for trees to start with. In the first place, he would seek ten acres of rich fertile land, somewhat elevated, with a naturally dry soil, just rolling enough to carry the water off readily. As soon in spring as it would answer, he would plow it deeply and harrow the surface fine, then stake out the ground so as to leave the trees sixteen feet apart when set. He would set every alternate row to Wageners and the balance to Rhode Island Greenings, Baldwins, Spies, and a few of choicest varieties of summer and fall apples. He would set the trees about the same depth in the ground they were in the nursery, but in after cultivation would raise the earth up some around every tree, so as to throw the water from them. At time of setting he would trim to whipstalks, head back a little, and plant to corn for two or three years, giving clean tillage, and by using fertilizers keep up the fertility of the soil. The third year from setting, the Wagener, I think, will begin to bear. The fifth year I should expect to gather one fourth of a bushel from each tree, or an average of that amount. The sixth year, one half bushel; seventh, one bushel; eighth, two bushels; ninth, three bushels; tenth, four bushels; making a total of $10\frac{3}{4}$ bushels to a tree—say three barrels of first-class packing apples, selling at \$1 net per barrel and $1\frac{3}{4}$ bushels of seconds at 10c., \$0.175, making \$3.175 from each tree, and from 1,600 trees (the entire orchard) the snug sum of \$5,080 for the first ten years. As fast as the trees get large enough to crowd each other, take them out, beginning with the little Wagener and keeping this thinning process as needed until you finally leave the trees 64 feet apart, freely admitting air, light, sunshine, and all the recuperative forces in nature, to sustain a long, fruitful old age; and as they yearly lay their rich fruitage at the door of the husbandman, it will rejoice his heart and fill his purse. Mr. President, I have much more to say; but fearing I have already occupied too much of your valuable time, will stop. Before quitting I would say, plant a row all around the farm, two rods apart.

H. G. BUCK: The first season after setting, I cultivate raspberry plants and let them grow without much pinching off, but the second year I cut back to within two feet, then pinch back; this induces plenty of laterals ready for the next season's crop, keeps the plant stocky and self-supporting. I cut out the old canes in the spring; leaving them in over winter helps support the new growths and keeps them in place. The Taylor blackberry is one of the best. It is hardy and prolific, quality good.

J. M. GRANGER: I think there is as much money in evaporated raspberries as there is in selling by the quart from the bushes. Large quan-

tities are evaporated in the east. The dry fruit sells for eighteen to twenty cents per pound. It takes three quarts of berries to make one pound of dried fruit.

WM. SCHUH: I have a small planting of gooseberries which has paid me as well, if not better, than most all other small fruits. I find ready sale for them. They are hardy and produce large crops annually. I have recently visited Mr. HAYES of Talmadge, Ottawa county, who has an extensive vineyard of Niagara grapes. I there saw some of the finest clusters of that variety of grape I have ever seen. Mr. HAYES follows the Kniffen system, using two wires, the lower one three and a half feet from the ground, the upper wire nearly seven feet high. The vines are twelve feet in the row and the rows ten feet apart. Only one main stalk is allowed to grow. All laterals are kept off below the lower wire, but at this point two laterals are allowed, one on either side. These form the arms for the lower wire. The main vine is then continued to the upper wire, forming two arms, one running each way. These are kept closely pruned and pinched back. Only the desired number of clusters is allowed for each vine. I only saw the older vines, or one part of his vineyard. I understand he has changed or improved upon the first setting. I am much pleased with Mr. HAYES' manner of growing and handling his vines.

MR. STRONG: Is there not another system for training vines in tree form, so they become self-supporting, which does not require a wire trellis?

MR. LAFLEUR: When I was in southern Missouri I found nearly all the grapes grown upon the tree or self-supporting system. It is also practiced to some extent in Michigan, when the vines are strong and old enough. It takes many years for a vine to become self-supporting. I too visited Mr. HAYES' vineyard. I like his method of handling his vines and shall follow it so far as I am able to do in growing my own vines. Something over one half of Mr. HAYES' 5,000 vines are set six feet apart in the row. This gives one whole wire to each vine for every twelve feet, the first vine trained to the upper wire, the second vine to the lower wire, alternating the whole length of the row. I like Mr. HAYES' method and am ready to learn of him, because he has demonstrated that he can do what he attempts to do with both vine and cluster, and puts into practice exactly what he recommends to others. His theory and practice are the same and a success.

UNION MEETING OF ALLEGAN AND WAYLAND SOCIETIES.

By invitation, the Allegan and Wayland societies held a union meeting at the commodious and homelike residence of Dr. TURNER, October 21. It is a type of an American citizen's home, where all arrangements indicate good sense, refinement and intelligence.

In the absence of the president, Dr. TURNER was called to the chair to preside. The first topic considered was strawberry culture, by A. NEWMAN.

I do not grow strawberries extensively, only for home use and the local market. Spring is the right time to set out the plants. If set in the fall they require good protection over winter. By plowing in the spring and setting in the fresh ground, it is less work to tend them the first season. I plant in hills, three feet apart, and cultivate both ways. I think mulch-

ing pays in the increase of berries, as the plants get a more vigorous growth early in the season.

Dr. RYNO: Plow in the fall and top dress with fine, well-rotted manure. Set the plants early in the spring, in rows three feet apart; cultivate thoroughly and keep the ground clean until fall. Cultivate and keep clean the second year. The third year the bed can not be kept quite as clean. Plow under at the end of third year and reset. Strawberries can be easily grown, but it is not so easy to find a good market within our reach.

A. J. WARNER: Almost any one can grow strawberries, but the marketing is the most difficult part. The matted row is the cheapest plan. The rows are more easily worked. I think that larger berries may be grown by the hill system, but the cultivation involves more expense.

A. J. BRACELIN: The people of Ohio grow strawberries for market and ship to Chicago and make it profitable, and I believe, with the right system and management, they can be grown here and shipped at a fair profit.

M. T. SMITH: Nearly every year the Chicago market is glutted with unripe strawberries, and altogether too many second-class berries, which reach that market in very bad condition. This causes a break in prices. Express charges and the commission often equal the price they sell for. The practice of sending unripe grapes to market, early in the season, results in ruining the business. When a person has eaten one bunch of sour grapes, it takes a long time to get over the dislike, and such a person will not often venture to try grapes again, neither will he buy them for his family. Fruit of any kind should be ripe when eaten.

A. SLADE: I grow strawberries for home use and find both profit and pleasure in them. I mulch or cover for winter with cornstalks. They are free from foul seeds.

L. A. LILLY: In Grand Rapids I have found the price varied according to the freshness and condition of the berries. Placing berries fresh and sound upon the market has much to do with the profits.

Rev. Mr. RAWSON: I grow strawberries for home use only. I think they pay well for all the care and labor bestowed upon them. I endeavor to keep the patch clean, free from grass and weeds. By so doing I can keep a patch four or five years without resetting.

JARED SMITH: I have grown strawberries mostly for home use, and find that a patch well cultivated and kept free from grass and weeds pays much better than if left full of foul stuff. I think there is a good profit in growing small fruit for market, but the cost of transportation eats up some of the profits. Perhaps some reform may be brought about in this respect.

G. H. LA FLEUR: If I lived on the lake shore, convenient to rail or boat, I should grow strawberries and ship to Chicago or Milwaukee; but I don't think we can depend upon that market for berries here. We are too far from the consumer, or we have to ship by rail only; consequently they do not reach those points in good, fresh condition; especially in hot weather, they become jammed and look mussy and sell accordingly. Freight and commission take the larger share. I think that if I lived near this place and grew strawberries for market, I should not attempt to ship to Chicago but should depend upon the home market—that is, sell them within the limits to which they could be placed in the hands of the consumer in fresh and sound condition. Grand Rapids and Kalamazoo and smaller towns, and also many farmers, would buy strawberries if brought to their doors. Shipping facilities and the wants of the market

should govern in the amount of strawberries grown in any locality, and this is applicable to all other fruits, especially small fruits.

A. J. BRACELIN: I believe in home markets, buying and selling at home. This might do on a small scale, but would not answer for a plantation of strawberries of any considerable size. We must seek distant markets to dispose of our berries. All the large cities (and there is where the largest share of strawberries is consumed) must be shipped to from a distance, and sometimes a long distance. If we grow berries for market we must depend upon the large cities or centers where most is consumed.

G. H. LAFLEUR: Those people living along the lake shore have largely the advantage over us who live so far from good shipping facilities. They place their berries on board a boat at night and they are landed next morning in Chicago or Milwaukee, looking fresh, as there is little or no jar on the boat, while berries carried by rail arrive later in the morning; besides, the jarring of the cars nearly spoils them. Hence I should grow strawberries only for the market near home, if I lived at Wayland or any point so far from the lake, and leave those who lived nearer to good shipping points, and especially by boat, to grow strawberries for western cities. In growing small fruit, the conditions should govern in the kind and the amount of fruit we grow.

At this point WM. H. SCHUH read the following paper on gooseberries:

I have only had one year of experience, but that has been a year of knowledge, and I might say profit. This fruit is known botanically as *Ribes*, and is northern in its habitat. The industry is not extensive in this state, but one that is being taken up by a few small-fruit growers. There is no fruit grown that is easier handled (especially the thorns). Gooseberries are mostly sold when green. There is a good market for the green fruit, but I think the time is not far off when there will be a good demand for ripe gooseberries. When ripe, to my taste, there is no fruit better for preserves. We find in growing them that we have to fight against the worms, the same as we have to work to save any other fruit.

The currant worm will take gooseberries in preference to currants, but if taken in time there is not much trouble. The gooseberry is very liable to mildew, especially when grown in the shade.

Among the best varieties are the Houghton, Downing, Smith, and Industry. The latter is of very recent introduction, to American growers, and has thus far withstood mildew quite as well as our varieties, and although a very large berry, I do not think it will come into general favor on account of its rough or hairy skin. Of the Downing I am not well informed. It is of good size, but not as large as the Industry, and it lacks quality. My choice is the Houghton, although it is not as large a berry as either of the others. It is very productive and of excellent quality, and comes into bearing young. I might state here how it came to be my choice—not from choosing it myself, but from swindling nurserymen Ballman Bros., of Monroe, Mich. But since my bushes have come into bearing I am glad they are the Houghton, only I did not wish to pay such exorbitant prices for them. I have 300 bearing Houghtons and shall increase them to 2,000 next spring.

In setting out, I should advise setting so as to cultivate both ways, say six by three feet apart. The gooseberry is easily propagated by layering in August or as soon as the leaves fall.

Dr. TURNER: I have talked with J. N. STEARNS, who is growing the gooseberry near South Haven. He tells me that he finds ready sale for all the gooseberries he has grown, and recommended the Industry and Downing.

G. H. LAFLEUR: J. G. RAMSDELL of South Haven has had experience in growing gooseberries for market. He recommends the Downing. A paper by Mr. RAMSDELL was read before the meeting at Shelby in June last. [It appears elsewhere in this volume.—EDITOR.]

A. J. BRACELIN of Watson read the following paper:

Perhaps a few ideas concerning the importance and prospects of fruit-raising, and the necessity of having a live pomological society in Allegan county, will not be wholly out of place at this time. The magnitude of the fruit interests of this county is too well known to need more than a word, and I shall not dwell on this part of the subject, only say that years when all kinds of fruit are abundant, we are prosperous and happy, partly from the large amount of money that comes to us from other sections, but largely from the health-giving influence of the fruit consumed; and years when it is scarce, or a failure, as it has been the present year, we are correspondingly poor and depressed. It can not be said, however, that fruit has been a complete failure this year with us. Indeed, compared with other sections of the country, we have been highly favored. If not by full-paying crops, by an abundance for home consumption, of small fruits; and what is lacking in quantity and quality of apples is greatly mollified by the high prices and ready sale for such as we have. Though of known inferior quality, they are bringing a large amount of money into the county. Notwithstanding this, a great many accounts will remain unsettled and a great many necessities will not be known for another year, on account of the peculiar failure, the unequal distribution of the crop. Baldwin trees, though known to be tender, are about the only ones that have borne fruit, and those having orchards of this variety are making a very nice thing. The nearly total failure in peaches is certainly a severe blow to growers of that fickle fruit; and considering the many enemies this tree and its fruit have, and the very great uncertainty of getting a crop, it is questionable whether this part of the fruit industry will ever become a practical and paying business to any considerable portion of Allegan county. But we produce the finest specimens of the finest varieties, and we have a reputation of having the spiciest, the tartest and most fully developed apple that grows; and since the territory that can produce even the poorer varieties, is limited, and since we have more than a reasonable assurance of raising a crop of this fruit every year, I believe the setting of apple orchards to be a safe and practical venture. Right here I will say to those who may wish to set orchards, that none but the finest varieties should be selected. Leave the poorer and worthless ones to be used in less favored localities.

I am impressed with Mr. GRANGER's scheme of setting trees one rod apart, with fifty per cent. Wageners, set alternately, to be removed when they crowd later bearers and longer lived varieties. The scheme is certainly worth any man's consideration who is thinking of setting out an apple orchard.

I hope I shall not be considered visionary or extravagant, when I say that there is a great fruit future in store for Allegan county; that every foot of naturally drained, arable land will eventually be occupied for raising fruit. This includes not only our best soils, but all the light sandy soils of our county, most of which show a natural fitness for producing

small fruits. That we shall be known as an apple-producing people for a long time to come, perhaps is true, yet the great adaptability of these light soils for producing small fruits is such that the time is not far distant when we shall supply the great northwest with these fruits, and not leave this to be done by our less favored brethren east and south of us. But a great change will have to be wrought before all this is consummated. People will have to be educated and many supplanted before all will engage in fruitgrowing. Pomology is a step in advance, intellectually, of agriculture, in its limited sense, and it is hard to get people to take steps forward out of old ruts. But the close competition in all business, at this time, and for time to come, will force this division of labor upon us, and we shall all have to cultivate the crops that by nature and our environments we are best adapted to grow, or be driven to the wall. In case of failure, others will take our places and carry out the great law, the fittest surviving. True, this is a great labor, and like other highly civilized industries should be organized, should be guided by intelligence, and should receive the impetus imparted from skilled hands and active brains.

Nothing can do this work better than our pomological society. It is a fact patent to every one that these organizations are among the most useful in the land. Pomology is becoming one of the fixed sciences, and reckons among its students some of our best scientific minds; and as it is largely experimental, it is not profitable or wise for one to try to obtain this knowledge from experience. Pomologists, as a rule, are ready to impart knowledge, and a fund of information may be obtained, and many mistakes avoided, by attending these meetings. One should not hesitate to ask any question upon which he desires information. I heard an intelligent, careful business man say, in speaking of his large peach orchard, that had he known as much when he set the orchard, about the peculiarities of certain varieties, their adaptability to certain soils, as he now does, he would have made \$10,000 out of his peach crop this year. The knowledge he gained by attending and observing his trees, is called experimental knowledge, and probably any good pomologist, at the time of setting these trees, could have given the information that cost him years of study and hard work, and ten thousand dollars besides.

Perhaps this is a rather strong case, but you will all agree, at least, that it is better to lock the door, in matters of growing fruit, before the horse is stolen. One should not engage extensively in this business without a thorough understanding of it before commencing, as a mistake then means, many times, a mistake through life.

I believe that fruit-men in disposing of their products, should act, to a great extent, as a single body. There should be a perfect understanding and knowledge among themselves as to the best ways of growing them. In fact, this appears the most difficult part of the whole business. Since the number engaged in growing fruit is not large, a combination of this kind is as practicable as the sugar trust, or binding twine trust, or the railway trusts, or the thousand-and-one trusts that are formed all over the land. Farmers would like to combine in this way, but are told that their numbers are too great and unwieldy, and all, including themselves, are agreed on this as by common consent. Hence every effort in this direction, so far, has proved abortive. That such a combination is possible and would prove of great value to fruit-men, I have not the least doubt. In fact, the organizations are already formed, and all that is needed is to introduce this business reform.

Fruit-men of California and Florida are fast working out this problem, with much satisfaction to themselves, and bid fair to revolutionize the whole system of disposing of their products. California fruits are disposed of by California men, from the Pacific to the Atlantic, having no commission men or houses between the producer and the retailer. I would not combine so much to govern and control market prices as to obtain them. You have all had experience with commission houses enough to know that often we get the commission and they retain the pay for the fruit.

Every grower should do his own packing or superintend it; in small fruits giving honest measure and throwing out all inferior specimens. In apples, all should be placed over his name as a guarantee of honest work, and should be graded from the top to the bottom of the barrel. Do not put the handsome specimens at the top of the barrel and the poor ones below, facing for the purpose of deceiving the purchaser. Good specimens may be used for facing, provided all below are equally good. But the practice of using large, perfect specimens for "facers," and filling the remainder of the package with inferior specimens, is a fraud that should be condemned by every honest man. There is nothing that has injured the reputation of Michigan apples so much as the dishonest packing that has been practiced for years, not so much by farmers as by professional packers. I repeat again, that every fruitgrower should do his own packing, and the first and most important requirement is honesty; the second, careful grading. Much could be said about the careful grading of fruit, especially apples, but it is not the design of this paper to enter into detail. I have only given so much general direction in packing apples because I have become thoroughly disgusted with our present methods, which allow persons to do the packing who are not interested in the good reputation of either ourselves or our fruit, and for whose every dishonest act we are held responsible. Fruit-men have enough of their own mistakes to answer for, without voluntarily becoming responsible for the dishonest acts of any who may deal in their products.

In regard to Mr. GRANGER's plan of setting an apple orchard, Mr. SCHUB of Wayland has quite clearly demonstrated that it will take at least seventy-five per cent. Wagners to set, instead of fifty. I readily see he is right, and you can verify it if you will take a few moments. Perhaps a plat of such an orchard drawn here will save you time:

B	W	B	W	B	W	B	W	B	W	B	W
W	W	W	W	W	W	W	W	W	W	W	W
B	W	B	W	B	W	B	W	B	W	B	W
W	W	W	W	W	W	W	W	W	W	W	W

and so on to the end. Mr. GRANGER evidently had not carefully considered the mathematical part of his plan.

A vote taken by the ladies present, for the choice of strawberries for canning, resulted: Wilson 7, Crescent 2, Capt. Jack 2, Jucunda 1.

Evening Session.

L. A. LILLY gave a talk upon the codlin moth. Almost everything we grow has its enemies, which must be guarded against and destroyed in order to obtain anything like reasonable results. There are many obstacles in the way of successful fruitgrowing which must be understood to

enable us to meet and overcome them, one of which is the codlin moth, which is perhaps the worst enemy of the apple, becoming more serious each year. Its natural history and habits is perhaps the first thing to be considered. We will commence with its first appearance in the spring, which occurs about the time apple trees are ready to blossom, in the form of a small gray moth. As soon as the blossoms fall and the apple is formed, this moth deposits one or more eggs in the calyx or blossom end of the apple, which at this time is always upright and remains so until the fruit grows to such size and weight as to cause them to turn downward, hanging to the stem just the reverse of the position they occupied when first formed. It is during the time that the blossom end is up that the egg is deposited in the calyx. In about eight to ten days these eggs hatch into tiny worms, which begin to eat into the apple and soon find their way to the core. Then the apple drops from the tree, carrying the worm with it. This worm soon eats its way out of the apple and conceals itself under the bark of the tree or some other convenient hiding place, winds itself into a cocoon, from which in time it comes out a moth, the same as those that deposited the eggs. The second crop of moths are now ready to deposit more eggs, somewhere on the apples, and those eggs soon hatch into tiny worms, the same as those in the spring, which eat their way into the apple as before, and after some time eat their way out at any part of the apple. It is this second crop of worms that causes wormy apples in the fall. Some of these worms remain in the apples and only eat their way out during winter, when they wind themselves in cocoons and hatch into moths in the spring; and this is the point where we commenced with them. Any one can now see that if we can destroy the first eggs we can prevent the apples from dropping, and also prevent the second crop of worms later in the summer, and by that means save the apple from the ravages of this second crop, as they are the cause of wormy apples in the fall. As has already been stated, at the time the eggs are deposited the blossom ends stand up, and any poisonous matter thrown on the apple falls into these cups and there remains until the newly hatched worm eats and dies. By the use of spraying pumps a solution of one pound of London purple or Paris green to 300 gallons of water can be thrown on the tree so as to reach the apples. This will naturally fall into these cups. This spraying should be done within ten days after the blossoms drop. Six days would be better, then repeat the operation ten days later. This is the most effectual remedy known.

P. C. POTTS: I have often found that the worms eat their way out of one apple and then eat their way into another apple if they hang so as to come together near where the worm comes out. Others have observed the same thing.

G. H. LAFLEUR: There were some thoughts presented by Mr. BRACELIN, in his paper, worthy of consideration. One of the ideas expressed in that paper was that fruitgrowers needed the benefit of such meetings as this, and especially that part referring to the importance of making use of what we learn by putting it into practice. There is need of a better understanding among fruitgrowers, and a chance for great improvement, beginning with the nurserymen. In growing the trees; in selecting the scions and the stock to graft upon; the manner of growing the trees; the management of the orchard; in buying the trees and handling the orchard and the fruit. There is much to be learned and put into practice in packing and shipping fruit and the matter of establishing evaporators for

using up the surplus or unsaleable fruit of all kinds. Cold storage can be provided, which will extend the season of several kinds of fruit. When we consider the great amount of money invested in fruit-bearing trees, vines, and plants, and the interests involved in the results, we can readily see the importance of obtaining all the knowledge in relation to the business, and the need of putting this knowledge into practice, not as a few individuals but as a community generally. All will admit that great changes for the better have been made within the past few years in growing fruit for market. Much greater changes can, and probably will, be brought about in the future. Progression in fruitgrowing is the true road to success. Those who are in the advance will always reap the greatest benefits.

L. A. LILLY: I have no doubt that most of us might improve in our methods in managing the industry; and what is needed in this line is that not only individuals but the whole community act upon these principles. We need the instruction and stimulus received at such meetings as this. The young men ought to attend and take hold of this matter. The older men have laid the foundation for fruitgrowing in Michigan, and made the way easy for the young men to reap great benefits from this industry. There is no danger of overstocking the market with apples if we grow the right kinds, and use good sense and intelligence in placing them on the market.

A. J. BRACELIN: We have all the natural advantages for growing fruit—soil, climate, shipping facilities, and continuous good markets. But we must get out of the old ruts and take and maintain a higher standard along the whole line of fruitgrowing. By so doing we shall make for ourselves a better reputation than we now have, although it is already fair compared with other states. Before Michigan fruit was known in the markets we met with slow sales; but as our reputation gained, sales increased and prices advanced. We can grow good apples and in large quantities, but we are not satisfied with our sales, and the buyers are not satisfied with our method of packing and sorting. These things should be better understood to enable us to do the business in such manner as will be just to all. We should systematize our plans and work together. There is one branch of this industry that is coming to be of great importance and a source of revenue to those engaged in it. That is canning and evaporating fruit, and especially working up refuse apples. If we can sell imperfect and refuse apples for a fair price for these purposes, men will have less temptation to work them off with the better class.

L. A. LILLY: The business of evaporating apples has steadily increased, the demand is still growing rapidly, and prices have advanced. I think the business is only just begun and will soon grow into one of great magnitude. This will consume all of our second-class apples and leave only first-class fruit to be put upon the market. I believe that every fruit-grower should take papers which will keep him posted and up with the times. This will more than pay the cost. We should keep posted on the markets of the world and know the ruling prices of all kinds of fruit.

GRAND RIVER VALLEY HORTICULTURAL SOCIETY.

Reported by THOS. L. BROWN, Secretary.

The following directors of the Grand River Valley Horticultural society met in executive session in the parlors of the Grand Rapids Savings bank: The president of the society, CHAS. W. GARFIELD, T. L. BROWN, EDMUND MANLY, THOMAS WILDE, and REV. JOHN SAILOR. A schedule of topics for discussion was decided upon for each month, as follows: Apples: Varieties to plant; selection of garden requisites from catalogues; culture of vegetables; where to obtain the best stock; help, indoors and out; top-grafting; sweet corn and peas, and best methods of preserving them; selection of fruit-tree stock; strawberries; desirable aspects of rural life; raspberry notes; ornamental trees and shrubs; how to make lawns; the apple orchard; varieties to plant, methods of marketing and gathering; best methods of preserving vegetables; economy in the utilization of fruits for family use; heat and ventilation for our homes.

FEBRUARY MEETING.

The February meeting was held in the supervisors' room in the city hall, Grand Rapids. About one hundred persons were in attendance. The large table contained some fine specimens of apples, Spies, Greenings, Grimes' Golden, Shiawassee Beauty, Baldwins, Wageners, and Russets. Branches of peaches were exhibited, and those least accustomed to borrow trouble predicted a very light crop of peaches for 1890. Branches of blackberries also showed the effect of the extremes of heat and cold they were being subjected to.

The topic for discussion was, "The apple: desirable varieties to plant." The following report was made by W. N. COOK: "Your committee was appointed about one year ago to consider the question, 'Which are the best varieties of apple for market,' having in view the prime consideration of quality. This question was asked by the president of the society, who called attention to the fact that our market was supplied with southern fruit. The thought was that by proper selection of our best sorts and proper methods of caring for and placing on the market, we ought to reverse this condition and reduce the competition to the use of fruit for dessert only. Your committee are of the unanimous opinion that none but the very best of our late keepers should be recommended by our society; and as indicated, the committee notes the following varieties as best: First, Northern Spy; second, Red Canada; third, Jonathan; fourth, R. I. Greening; fifth, King. Of the newer sorts, Shiawassee Beauty and Grimes' Golden; of sweet apples, Talman, Bailey, and Green Sweet. The Baldwin is not included in the list, because it is inferior as a dessert fruit and the tree is tender, not able to stand the cold as the other sorts."

To comply with a request of Prof. L. R. TAFT, for twelve best sorts, the Baldwin and Roxbury Russet were added. A long discussion followed the report of the committee, and the merits and demerits in detail of each and every variety were fully discussed.

Next followed a selection of a variety of pears. The varieties named were Flemish Beauty, Bartlett, Anjou, Clapp, Angouleme, and Sheldon. Of peaches, Alexander, Waterloo, Hale's Early, Lewis, Snow's Orange, Early Crawford, Stump, and Hill's Chili.

W. N. COOK recommended the following sorts of cherry: Early Warren and Yellow Duchess.

In grapes, H. H. HAYES named Moore's Early, Niagara, Worden, Brighton, Delaware, Salem, and Agawam.

Of strawberries, Crescent, Sharpless, Jessie, and Miner were recommended.

Blackberries, HENRY SMITH named the Taylor and Snyder.

THOMAS WILDE gave the names of Cuthbert and Ohio in raspberries.

MARCH MEETING.

The March meeting of the society was held at the Grandville grange hall. The morning session opened with a discussion on fruit prospects, the outcome of which confirmed the fears expressed at the February meeting, of a light crop of peaches.

The next business taken up was packages for small fruits.

Rev. GEORGE HENRY DOLE delivered an address upon "The origin and operation of forces in nature," and the secretary of the society read a paper on "Economy and comfort of the kitchen garden."

THE APRIL MEETING.

was held at the floral establishment of HENRY SMITH on West Bridge street. President GARFIELD opened the meeting by calling attention to the recently published bulletins from the Agricultural College: No. 57, experiments with vegetables; No. 58, insecticides, and No. 8, devoted to the comparative merits of steam or hot water heating for greenhouses. One hour was consumed in the morning session in discussing evergreens and ornamental shrubs. At the close of this interesting and valuable topic, Mr. HOMER HAYES asked permission to exhibit some branches of peach trees. A little better feeling in regard to the peach crop was noticed, as the buds were not all killed, and it was argued that a light crop of well developed fruit would be better than if the buds were all alive. But Mr. PEARCE was as despondent as ever and predicted an extremely light crop. Mr. GARFIELD said the Oceana county men were quite jubilant, and the value of fruit lands in consequence of the fine condition of the trees had risen. W. N. COOK was in favor of covering peach trees with straw; this could be done at ten cents per tree. The members were getting so interested in pomology and the best methods to pursue in order to be reasonably successful, that time was forgotten and Mr. GARFIELD called a halt, stating that it was half-past twelve and time for recess.

During the hour and a half given for luncheon, more than one hundred persons found the large greenhouses a pleasant place to promenade, and the oft-repeated expressions of surprise and delight must have been gratifying to Mr. SMITH.

At two o'clock, President GARFIELD again called the meeting to order, and "Orchard spraying" occupied the attention of the society for some time.

"Help indoors and out" was the chief topic of the day, and the mem-

bers settled down to a thorough investigation of the causes of the decline of competent labor in the rural districts. In these discussions the ladies took a valuable part and theories were advanced that would seem to prove that good indoor help was redeemable. In regard to outdoor help the outlook was not so promising. The cities could pay more than the country. This, with other attractions, was constantly drawing the best help from the country, leaving a less intelligent, and consequently more dangerous, element for the farmer's help. One way out of the difficulty seemed to be in reduced hours of labor.

The afternoon session contrary to the usual custom ran over the allotted time and the president again had to announce that it was time to adjourn; the subject was to be continued in May.

MAY MEETING.

The May meeting was held at the grange hall in Paris. The attendance was light but much interest was shown when discussing. The topics were "Sweet corn and peas: varieties, methods of culture, and marketing," and "management of newly planted trees."

President Garfield called the meeting to order. The secretary read a communication from S. E. Keifer, stating that illness in his home would make it impossible for him to entertain the society at the June meeting. Spring onions were exhibited with the roots on, and although the system of marketing was perhaps not quite so showy, the public would be greatly benefited if they would buy for worth and not for beauty. As soon as an onion root is severed from young, tender, spring onions, the volatile oil escapes and the most essential part of their worth is lost. They soon wilt and become tough. The secretary expressed sorrow for the lack of knowledge exhibited by growers as well as the public in this respect.

The president read a valuable paper on various matters of importance; first, upon the importance of an early preparation of exhibits for the Detroit Exposition; secondly, some words of commendation for the efforts of S. S. Bailey to give the public the benefit of his experience with new sorts of strawberry, and lastly showing how utility and beauty can be either won or lost in our methods of tree planting. At the close of this interesting paper, Mr. Garfield exhibited some buds of asparagus that had been broken off. This was, he claimed, the proper way to market the crop, as that cut below the ground is too tough to eat. Mr. Garfield also advocated the method of buying and selling by the pound. This way had considerable promise of coming into use, and many present expressed a wish to see the system early adopted.

Upon coming to order in the afternoon session, S. S. BAILEY called attention to the merits of the different kinds of strawberry he had on exhibition and called especial attention to his favorite, Maggie.

The labor question was again resumed, but only proved a repetition of the ideas advanced at the April meeting, and the president announced that no more time at present could be devoted to that question.

The best varieties of sweet corn and peas, to plant, and how to plant, developed much interest and occupied the greater part of the afternoon session, but before closing "Spray pumps and nozzles" proved a great concern to a few orchardists in one corner of the room.

JUNE MEETING.

The June meeting convened at the home of A. J. GILL, on West Bridge street. Vice-president PEARCE called the meeting to order and asked for testimony in regard to fruit prospects. The apple crop was several points below the condition reported at the May meeting. The strawberry crop, which was just now in its height, was the largest ever taken. At this time raspberries promised well, but other fruits were reported very scarce indeed, with the exception of grapes. The finest display of strawberries exhibited by the society was made at this meeting, and S. S. BAILEY carried off the honor of having the best grown and largest collection; but the best single box of Sharpless was exhibited by E. CHASE PHILLIPS.

The afternoon session was wholly devoted to notes on strawberries, and all in all the day was a pleasant and profitable one.

THE JULY MEETING.

Was held at the fine country home of S. S. BAILEY at East Paris. President GARFIELD's voice was heard above the discordant tones of many groups of people chatting on various subjects. The voice reached to all corners and was asking the society to adjust themselves in as easy positions as possible. This announcement was taken for a notice to come to order. After a few opening remarks, the president said: We are fortunate to have with us today Hon. T. T. LYON, and we will be delighted to hear from him in his experimental work at the sub-station at South Haven. Mr. LYON gave a very full account of his labors, and Prof. TAFT encouraged him in the work. One of the topics for discussion was, "Desirable attributes of the country home." Much profit was gained from this well-chosen subject, and the gentlemen were compelled to admit that their wives had much to do with the embellishment of their homes. Considerable time was devoted to "Notes on Raspberries," both in the habits and growth of the different kinds, and in the flavor. The members were able to make a practical test from the large dishes of ripe berries served with cream at the lunch.

THE AUGUST MEETING

was held on the grounds at the Soldiers' Home. The day was a pleasant one. President GARFIELD called the meeting to order and stated the topic for discussion, "Ornamental trees, vines, and shrubs," and "Making of Lawns." A communication from Mr. E. C. REID of Allegan was read. The letter stated the progress made in the collection of fruits and flowers for the Detroit Exposition the following month.

"We have with us today," said President GARFIELD, "Prof. L. R. TAFT of Agricultural college, and we feel we can safely have our questions answered relating to the subjects chosen for this meeting."

A very creditable display of fruit was made. J. B. LOWES exhibited, among other fruit, a bunch of grapes, extra large size, the result of girdling the vine; WM. A. BROWN of Benton Harbor sent a peach of Brown's Early, which seemed identical with the Early Michigan shown by PETER FENNING of Lowell; C. L. BISSELL exhibited Bradshaw and Imperial Gage plums and Worden grape. Vice-president PEARCE made a fine display of Bartlett pears, and S. S. BAILEY brought Hill's Chili peaches.

After lunch, GEO. CHUBB of Lisbon delighted the audience with two of his recitations.

President GARFIELD again called the meeting to order and introduced the topic, leading with a short chat, fitting the company to realize the possibilities of our own locality when making up a list of ornamental trees to beautify our homes, and closed by introducing Prof. L. R. TAFT.

For more than one hour the large gathering listened to the address of Prof. TAFT, and heard what to plant, how to plant, and when to plant, and how to prepare the ground for a lawn and maintain a healthy condition of grass.

PETER PEARCE recited, "The Old Man and Jim." President GARFIELD, S. S. BAILEY, Rev. JOHN SAILOR, and W. N. COOK, respectively, continued the discussion of "Embellishment of Homes." "The Samaritan," written by Rev. A. J. HUFF, was recited by GEO. CHUBB, and an adjournment until the fourth Tuesday in September was announced.

THE SEPTEMBER MEETING

convened at the home of ASA W. SLAYTON, on Ives street. Mr. SLAYTON has spared no pains to make home a pleasant spot, as the workshop, the museum, and the kitchen garden all testified to the possibilities of home-making.

President GARFIELD, in opening the meeting, called attention to the fine display of fruits to be seen on the market every morning through August and September.

The exhibition of fruit, and especially grapes, was remarkably fine—indeed, one could hardly enter the house, for grapes depended from vines in tempting array upon the piazza.

W. N. COOK and DIXON DAVIS were made a committee to report on the fruit exhibit.

The afternoon session was devoted to a discussion of grapes, which became general. The proper soil, situation, varieties to plant, and distance apart, gave almost all present either a chance to say something of his method or ask a question of the more expert growers.

A short chat upon the necessity of a city market was indulged in, and S. S. BAILEY offered a resolution calling the attention of the common council to the matter.

THE OCTOBER MEETING

of the society was held at the grange hall at Herrington, Ottawa county.

President GARFIELD called the meeting to order, and, after the usual opening remarks and suggestions, announced that the topics for the day were upon "The Apple Orchard," and "Pruning Grapevines," and called on JOSEPH A. PEARCE to explain the "renewal" system of pruning a vine. The vine was brought into the hall in the manner in which it grew, and he pruned it before the audience. This practical lesson was frequently interrupted by questions from those interested in the subject.

Mr. W. K. MUNSON followed Mr. PEARCE with the "Kniffen" system of pruning grapevines. This way was well received by the society. Both systems are good, and the friends of either had points of defense for their

way, in the lively and general debate which followed the remarks of these two experienced growers.

H. H. HAYES related the adventures he had recently passed through in a trip to North Carolina.

The picking and storing of apples was then discussed for one hour.

A communication was read from S. L. FULLER, in which he renewed his former assertion that the western states would never become good fruitgrowing sections.

Mr. THOS. WILDE, in opening the discussion upon apples, declared that the people of Michigan and especially those of the western portion of the state, did not half realize the possibilities of fruitgrowing, and stated that the business was yet in its infancy. Messrs. PHILLIPS, WILLARD, SLAYTON, ALFORD, PEARSALL, and KELLY participated in the discussion, and the meeting closed an acknowledged successful one.

THE NOVEMBER MEETING

was held at Harmony grange hall in Walker. President GARFIELD, in calling to order, stated that the secretary could not be present, and ASA W. SLAYTON was chosen secretary *pro tem*.

A sample of beet sugar was brought for inspection and pronounced of good quality. The sugar was manufactured in Iowa and received from Dr. KEDZIE of Agricultural college. After a few remarks on beet sugar and soils for its best growth and other matters of timely importance, President GARFIELD announced the topics for the day, which were "Cultural management of fruits," and "Preparation and cooking of vegetables." JOS. A. PEARCE stated that Napoleon gave \$600,000 per year to encourage the production of beet sugar in France, beginning with sugar at 40c. per pound and ending with sugar at 3c. per pound.

A long and general discussion on the different topics of the day occupied the society until its adjournment.

LENAWEE COUNTY HORTICULTURAL SOCIETY.

OFFICERS FOR 1891.

President—Mrs. M. S. TRINE, Adrian.

Vice-President—C. W. SHEFFIELD, Adrian.

Secretary—T. J. GIBBS, Adrian.

Treasurer—B. I. LAING, Lenawee Junction.

Librarian—Dr. W. OWEN, Adrian.

Executive Committee—H. C. BRADISH, E. W. ALLIS, D. G. EDMISTON, Mrs. H. C. BRADISH, Mrs. C. W. SHEFFIELD, Mrs. A. SIGLER.

The society has held 12 meetings, as follows: five of which were held in the city of Adrian, at Temperance rooms; the remaining seven were held at private residences of the members, except two, one at the home of C. C. FISHER, one at the residence of GEO. B. HORTON. At the June meeting, held at the residence of J. W. HELME, the society held a strawberry show which was fairly well represented considering the lateness of the date, the 25th.

At the July meeting the society held a special meeting for the young people, with a view to interesting the young in the subject of horticulture. The meeting was very well attended and a good time enjoyed, the programme consisting of music, address by the Rev. J. M. KERRIDGE, speaking, recitations, papers, etc.

At the August meeting the committee appointed to take into consideration the advisability of making display at the Detroit Fair, reported that, owing to the scarcity of fruit, they do not find it advisable to do so.

The horticultural exhibit at the county fair was fairly good, except as to apples, which was not as large and fine as heretofore.

As far as the observation of the secretary goes, apples have been a poor crop, but those that had them to sell reaped the benefit of high prices for inferior fruit. Small fruits were of fair quality and quite plenty with the exception perhaps of strawberries.

The society has 27 paid up members, is in a flourishing condition, and the prospects for 1891 bid fair to maintain the reputation and standing of the society.

T. J. GIBBS,
Secretary.

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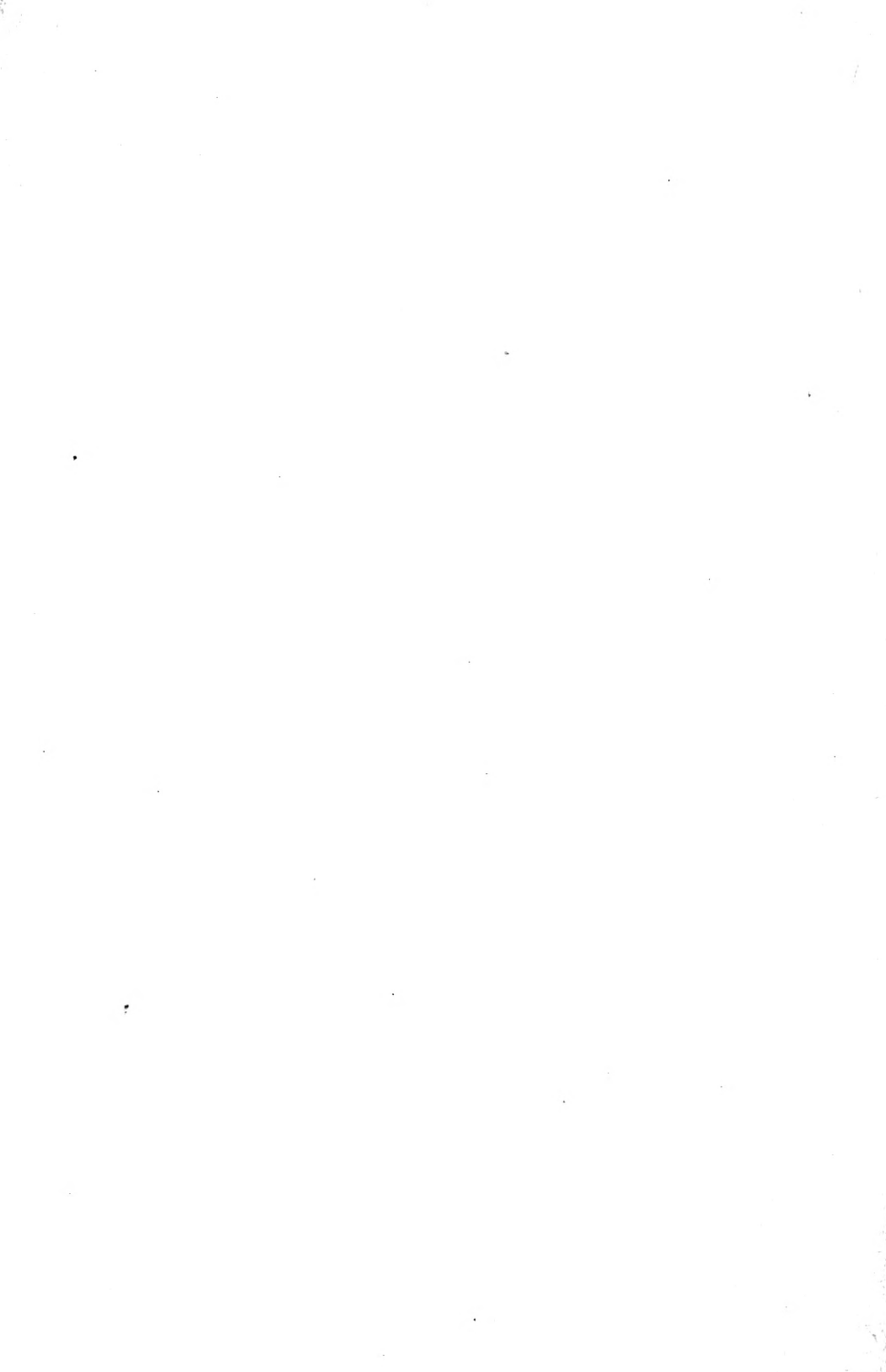
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